



FRIDAY, SEPTEMBER 29.

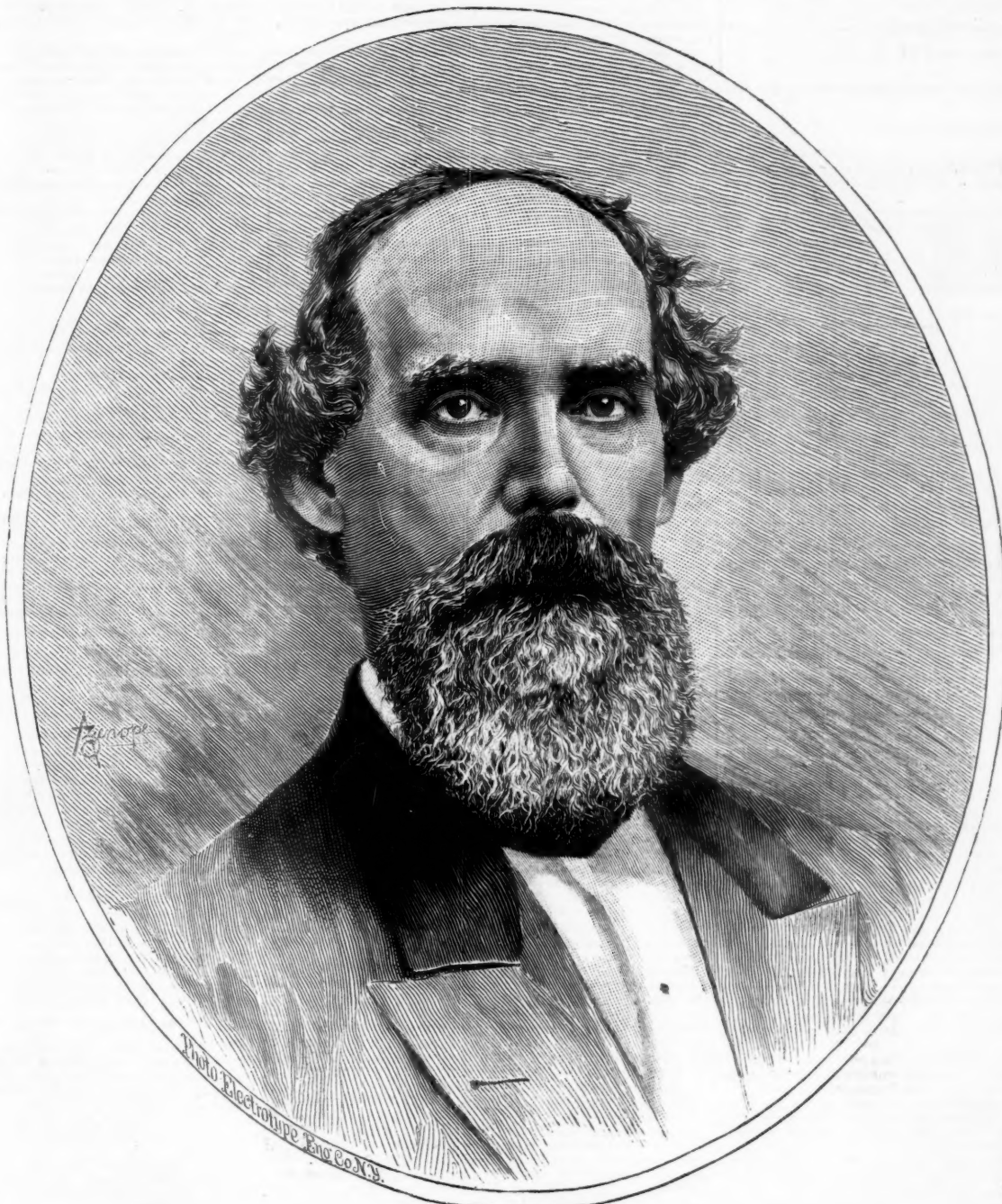
## The Late Samuel J. Hayes.

It would be difficult to name any man whose death will cause more sincere grief among his co-laborers than will that of Mr. Samuel J. Hayes who died at his residence in Chicago on the morning of Sept. 21. Mr. Hayes was born Oct. 9, 1816, near Powhattan Factory, four miles from Baltimore, Md., and therefore was within a few days of being 66 years old at the time of his death. His father died when he was four years old, and at six years of age he began to work in a cotton mill, where he remained until he

was in a more or less embryonic condition, and was undergoing a slow process of development. It was a period, therefore, requiring the exercise of wise prudence and conservatism in its management. These traits Mr. Hayes possessed in an eminent degree. Ross Winans' camel engines were then regarded with especial favor by those in authority, and nearly all the freight engines supplied to the road were of this pattern. Mr. Hayes, to obviate some of the inherent difficulties of an eight-wheel-coupled engine without a truck, designed and built some ten-wheeled engines with six-coupled wheels and a four-wheeled truck. The Winans locomotive had remarkably large fire-boxes, some of them about 7½ feet long, and 8½ wide inside. Mr. Hayes reduced the size of the fire-boxes of his engines, and soon after a trial of the economy of the two kinds was made. Winans was an advocate of a very large grate, whereas Mr. Hayes discerned the fact that a grate might be too large for economy, and therefore he reduced that of his engines with dead plates,

to act as its General Manager. He induced Mr. Hayes to accept the position of Superintendent of Machinery of that line under him, and in July, 1853, Mr. Hayes severed his connection with the Baltimore Company and moved to Chicago, and from that time until his death, 26 years, he occupied that position uninterruptedly, notwithstanding the fact that the general management of the road was changed a number of times. He enjoyed the confidence of the chief executive officers of that company to a remarkable degree, and in more than one instance, when those of less authority manifested an inclination to displace him, he was sustained in his position by the President of the company.

The quality of Mr. Hayes' mind was characterized more by great conservatism and prudence than originality, although he was ready at all times to adopt new things when their success had been demonstrated. He took out a number of patents, among them one for a method of fastening locomotive tubes with copper ferrules, but in this inven-



SAMUEL J. HAYES.

was 17. He was then apprenticed as a machinist in the shops of the Baltimore & Ohio Railroad at Mount Clare in Baltimore. These were then under the management of Gillingham & Winans. In 1839 there was a strike among the men in the shop, in which Mr. Hayes took no part, and as a consequence he was promoted to the position of foreman of the shop. Soon after the boiler of a locomotive in the shops was burned, for which he was held responsible and suspended. He then removed to Winchester, Va., where he remained some time. He was married Sept. 17, 1839, to Martha E. Johnson, of Baltimore, who survives him. After a short stay in Winchester Mr. Hayes again entered the service of the Baltimore & Ohio Railroad as Master Mechanic, and in 1852 was promoted by Mr. Wm. Parkin, then General Superintendent, to the position of Master of Machinery. He occupied that position until July, 1856.

That period was one of the most critical in the history of the Baltimore & Ohio Railroad. The company was extending its line to the Ohio River, and had little money, and it was a struggle to keep a float. The rolling stock of the road

Winans was consequently beaten in the first trials, and was compelled to adopt Hayes' expedient.

The success of these ten-wheeled engines was illustrated in a very remarkable way. After Mr. Hayes left the road in 1856, he was succeeded by other men who built different patterns of engines. After John C. Davis was appointed Master of Machinery of the road, in 1865, he was instructed to select the most efficient freight engines on the line, and build new ones like them. He decided that the ten-wheeled engines designed by Mr. Hayes more than ten years before were the best, and continued to build them until they were supplanted by the Consolidation engine.

During the period of Mr. Hayes' administration on the Baltimore & Ohio Railroad there was much dissatisfaction among the employes and discussion among the managers. Several strikes occurred, but in all that period he conducted the affairs of his department with great discretion and success.

Some time before he left the service of the Baltimore & Ohio Railroad Mr. John H. Doane, the Superintendent of the road made an engagement with the Illinois Central Railroad

tion he was probably anticipated. He also patented a water purifier and lime-catcher, which was applied to the Illinois Central and other railroads.

He was for a number of years Treasurer, and one of the most active members of the Master Mechanics' Association, and also a member of the Master Car-Builders' Association. In both organizations he will be very much missed.

There is perhaps no relation in life, excepting those which exist in the family, which affords such an excellent opportunity for discerning the good and the evil in a man's character as that of employe and employer. For about three years, the writer of this brief history was brought into daily intercourse with Mr. Hayes, was subject to his directions, and advised with him over a drawing-board regarding the design and construction of work in the department over which he presided. Like all of us erring mortals, Mr. Hayes had faults, but with such opportunities as the above described relations afforded for observing his character, the writer can say that his faults were such as would wound others least. He was uniformly considerate to those subject to his authority, and during all the period referred to but



one occasion can be remembered when his language or bearing to the writer was harsh or inconsiderate, and then the fault was not Mr. Hayes'.

He was always interested in the welfare of his employes and took pleasure in doing them a good turn, and to those associated with him in other relations of life he was a pleasant companion and was always ready to co-operate in any work connected with his occupation.

His health had been failing for some time past, and those who saw him last at the convention of the Master Mechanics and Master Car-Builders' Associations noticed a great change. Nothing serious, though, was thought of it until a few months ago, when he obtained leave of absence and undertook a trip to Denver. On arriving at Kansas City he was attacked with hemorrhage and had to return to Chicago. The cause of his death was probably consumption.

None but his own family will mourn his death more sincerely than his old employes, and many of them will associate him in memory with some helpful act, encouraging words or wise counsel, and all will remember him as a kind-hearted man and true friend.

### Train Accidents in August.

The following accidents are included in our record for the month of August:

#### REAR COLLISIONS.

On the evening of the 1st a passenger train on the Atchison, Topeka & Santa Fe road ran into the rear of a freight train which was going into a siding at Caddo, Col., wrecking three cars.

On the morning of the 3d a freight train on the Pennsylvania Railroad broke in two near Bainbridge, Pa., and the rear section ran into the forward one, wrecking several cars.

On the morning of the 4th a freight train on the New York, Lake Erie & Western road was backed into a passenger train in the yard at Rochester, N. Y., damaging the baggage car.

On the afternoon of the 4th 17 cars of a coal train on the Cranberry Branch of the Buffalo, Pittsburgh & Western road broke loose and ran back down a steep grade and into another train standing on the track near Cranberry Mines, Pa. Thirty cars were piled up in a bad wreck. There were a number of coal miners on the train; five of them and the conductor were killed, and 13 badly hurt.

On the morning of the 5th a freight train on the Wabash, St. Louis & Pacific road ran into a preceding freight, near Litchfield, Ill., wrecking three cars. There was a dense fog at the time.

Very early on the morning of the 6th a freight train on the Pennsylvania Railroad ran into the rear of a preceding freight near Monmouth Junction, N. J., there being a heavy fog at the time. The engine and several cars were damaged and the engineer hurt.

On the morning of the 6th some boys took the brakes off a gravel car which was standing on the New York, Susquehanna & Western track near Two Bridges, N. J. The car ran down a high grade, attaining a great speed, and ran into an engine which was standing on the track at Sparta. The car and the tender were wrecked.

On the morning of the 7th a freight train on the Lake Shore & Michigan Southern road ran into a preceding freight near Fremont, O., wrecking several cars.

On the evening of the 9th a freight train on the Indiana, Bloomington & Western road ran into a preceding freight near Bellefontaine, O., wrecking an engine and several cars.

Early on the morning of the 11th a freight train on the New York, New Haven & Hartford road ran into the rear of the milk train, which had stopped at Greenwich, Conn. An engine and three cars were wrecked. A flagman had been sent back, but the following train was too close to be stopped in time.

On the morning of the 11th a freight train on the Pennsylvania Railroad ran into a preceding freight near Monmouth Junction, N. J., wrecking several cars.

On the evening of the 11th a freight train on the Pittsburgh, Cincinnati & St. Louis road ran into a preceding freight in Newark, O., doing some damage. The accident was caused by a misplaced switch.

Very early on the morning of the 12th a freight train on the New York & New England road ran into another freight which had stopped at Putnam, Conn., for water. An engine and several cars were badly broken and a brakeman hurt.

Very early on the morning of the 12th a freight train on the New York, Lake Erie & Western road ran into a pusher engine standing on the track near Deposit, N. Y., damaging the engine and two cars. There was a dense fog at the time.

On the morning of the 12th a freight train on the Pennsylvania Railroad ran into the rear of a preceding freight near Frenchtown, N. J., wrecking several cars.

On the morning of the 15th a freight train on the Pittsburgh, Cincinnati & St. Louis road ran into the rear of a preceding freight, which was going into a siding near Richmond, Ind., doing some damage.

On the evening of the 15th a passenger train on the Philadelphia & Reading road ran into a shifting engine which was standing on the track at Fair Hill Junction in Philadelphia. The engine and cars were damaged and two passengers hurt.

Very early on the morning of the 16th a freight train on the Lake Shore & Michigan Southern road ran into a preceding freight near Pine, Ind., wrecking several cars and blocking the road five hours.

On the night of the 16th a freight train on the Wabash, St. Louis & Pacific road ran into a preceding freight near D. Iphi, Ind., wrecking two cars.

On the night of the 16th a freight train on the Ohio & Mississippi road ran into a preceding freight at Iuka, Ill., wrecking two cars.

Very early on the morning of the 18th a freight train on the Illinois Central road ran into a preceding freight which had stopped at Kensington, Ill. The engine and several cars were wrecked and a drover in the caboose badly hurt.

Early on the morning of the 18th a Central Pacific freight train ran over a misplaced switch and into a Utah Central passenger train on a siding in Ogden, Utah. An engine and two cars were damaged and an engineer hurt.

On the night of the 18th a passenger train on the Philadelphia & Reading road ran into the rear of a freight near Taber, Pa., wrecking several cars.

On the night of the 18th two sleeping cars of a passenger train on the Ohio & Mississippi road broke loose from the train near Olney, Ill. The jerk of the bell-cord signaled the engineer to stop, and he at once put on the brakes and stopped the train, when the detached cars ran into it. Several cars were damaged, one passenger killed and 15 more or less hurt.

On the evening of the 19th a freight train on the New

York Central & Hudson River road ran into the rear of a preceding freight in Schenectady, N. Y., wrecking several cars. The wreck caught fire and four cars were destroyed.

Very early on the morning of the 20th a freight train on the Pennsylvania Railroad ran into the rear of a preceding freight which had stopped at Bristol, Pa., for water. Ten cars were wrecked and an engine badly damaged; the caboose caught fire and was burned up. Six trainmen were hurt and the road blocked five hours.

On the morning of the 20th a section of a circus train on the Wabash, St. Louis & Pacific road ran into the preceding section at New Burnside, Ill., wrecking the rear car, in which were a large number of circus men. Three were killed and 30 hurt more or less severely.

On the morning of the 21st a freight train on the Virginia Midland road ran into a ballast train which had stopped near Tye River, Va. Six cars were wrecked and three trainmen hurt. A colored laborer was thrown 20 feet away from the track, but struck on his head and escaped unhurt.

On the morning of the 22d as a passenger train on the New York, Susquehanna & Western was approaching the junction of the city branch in Paterson, N. J., the switchman became confused and suddenly opened the switch. The train ran upon the branch track and into the rear of the branch passenger train which was waiting there, damaging the car. Two trainmen were slightly hurt.

On the morning of the 22d a freight train on the Chicago & Alton road ran into the rear of a repair train near Alton, Ill., wrecking five cars.

On the afternoon of the 22d a passenger train on the Chicago, Rock Island & Pacific road ran into the rear of a freight train which had stopped at West Davenport, Ia., for orders. Four cars were badly broken.

Very early on the morning of the 23d a peach train on the Philadelphia, Wilmington & Baltimore road ran into a preceding peach train near Kirkwood, Del., wrecking the engine and 13 cars. The engineer was badly hurt.

On the afternoon of the 23d a wild engine on the Pennsylvania road ran into a freight train at Monmouth Junction, N. J. The engine and several cars were badly broken, the engineer fatally injured and the fireman less severely hurt.

On the morning of the 26th a passenger train on the Reusseler & Saratoga road ran into a preceding passenger train which had stopped near Waterford Junction, N. Y., to remedy some slight defect in the brakes. An engine and one car were damaged, two trainmen and a passenger hurt.

On the morning of the 26th a freight train on the Indianapolis & St. Louis road ran over a misplaced switch and into another freight on a siding in East St. Louis, Ill., damaging several cars.

On the night of the 27th a freight train on the Baltimore & Ohio road ran into a preceding freight which had broken in two near Oakland, Md. The engine and 10 cars were badly broken and a number of mules killed.

About noon on the 28th a freight train on the Louisville & Nashville road ran into a preceding freight which had stopped at Greenville, Ala., wrecking several cars.

On the night of the 28th a stock train on the Atchison, Topeka & Santa Fe road ran into a freight train which was going into a siding at Wakarusa, Kan. An engine and three cars were wrecked.

On the night of the 30th a coal train on the Central Railroad, of New Jersey, ran into a preceding coal train in Phillipsburg, N. J., wrecking nine cars.

Near midnight of the 30th a freight train on the Pennsylvania Railroad ran into a preceding freight near Bird-in-Hand, Pa., wrecking several cars and injuring two brakemen. There was a dense fog at the time.

On the afternoon of the 31st a freight train on the Northern Pacific road ran into a preceding freight which had stopped near Detroit, Minn., wrecking the engine and several cars, damaging a number of others and blocking the road 10 hours. A flagman was sent back but the second train was too near to be stopped in time.

#### BUTTING COLLISIONS.

On the morning of the 1st there was a butting collision between two freight trains on the Lake Shore & Michigan Southern road near South Bend, Ind. Both engines and 40 cars were piled up in a very bad wreck, and the wreck was almost entirely destroyed by fire. Both engines were badly hurt and seven tramps, who were stealing a ride, are believed to have been caught in the wreck and burned up. The accident was caused by failure to deliver an order to one of the trains.

On the afternoon of the 2d there was a butting collision between two freight trains on the Philadelphia & Reading road near Tamaqua, Pa. Both engines and several cars were wrecked.

On the night of the 8th there was a butting collision between two freight trains on the Southern Pacific road in the San Geronio Pass, Cal. Both were running slowly and but little damage was done.

On the morning of the 10th there was a butting collision between a passenger and freight train on the Indiana, Bloomington & Western road near Springfield, O., the result of a mistake in orders. Both engines were wrecked, an engineer killed and three other trainmen hurt.

About noon on the 11th there was a butting collision between a passenger train and a wild engine on the New York & Canada road near Putnam, N. Y. Both engines were wrecked and two cars thrown down a steep bank into Lake Champlain, one of the engines falling after them. An engineer was killed, seven trainmen and two passengers badly hurt. The wild engine had orders to meet the passenger train at Dresden, but the engineer (who was killed) did not stop.

On the morning of the 14th there was a butting collision between two freight trains on the Lake Erie & Western road near LaFayette, Ind. Both engines were somewhat damaged.

On the morning of the 14th there was a butting collision between a passenger and a freight train on the Cleveland & Marietta road near Hilger's Crossing, O. Both engines were damaged, a passenger killed and five hurt.

On the morning of the 15th there was a butting collision between a freight and a repair train on the Lake Shore & Michigan road near LaFayette, Ind., doing some damage.

On the afternoon of the 15th there was a butting collision between a freight and a ballast train on the Chicago, Milwaukee & St. Paul road, near Dedham, Ia. Both engines were damaged.

On the evening of the 15th there was a butting collision between a repair train and a yard engine on the Atchison, Topeka & Santa Fe road in Topeka, Kan. Both engines were somewhat damaged.

On the morning of the 16th there was a butting collision between two freight trains on the New York & New England road near Hampton, Conn., by which an engine and 17 cars were thrown over a bank and piled up in a bad wreck, and the other engine damaged. The accident is said to have been caused by a mistake in orders. An engineer and a fireman were slightly hurt.

On the afternoon of the 16th there was a butting collision between two freight trains on the Baltimore & Ohio road near Keystone Junction, Pa. Both engines and 23 cars

were piled up in a bad wreck and a tramp was hurt. One of the conductors is said to have misunderstood his orders.

On the morning of the 17th there was a butting collision between a freight and a construction train on the Northern Pacific road near Ritzville, Wash. Terr., by which both engines and several cars were slightly damaged, and two Chinese laborers hurt.

On the evening of the 21st there was a butting collision between a shifting engine and a coal train on the Delaware, Lackawanna & Western road at Washington, N. J. Both engines were damaged, two trainmen killed and two hurt.

On the morning of the 22d there was a butting collision between a freight and a repair train on the Lake Erie & Western road near Ft. Recovery, O. Both engines were damaged.

About noon on the 24th there was a butting collision between a passenger train and a wild engine on the Illinois & St. Louis road near Lake, Ill. Both engines and a car were badly broken, the engineer killed and the fireman hurt so that he died a few days afterwards.

On the evening of the 24th there was a butting collision between two freight trains on the Milwaukee, Lake Shore & Western road near Appleton, Wis., by which both engines and several cars were badly damaged.

On the night of the 25th there was a butting collision between two freight trains on the Illinois Central road near Cabery, Ill. Both engines and several cars were wrecked. The accident is said to have been caused by a mistake in orders.

On the morning of the 26th there was a butting collision between two coal trains (one of them drawn by two engines) on the Pennsylvania Railroad near East Tyrone, Pa. All three engines and several cars were badly broken, a conductor killed and six other trainmen hurt. There was a heavy fog at the time.

Near midnight on the 29th there was a butting collision between a passenger train and a wild engine on the Cumberland Valley road at Chambersburg, Pa. Both engines were badly damaged, and an engineer hurt so that he died in a few hours.

#### CROSSING COLLISIONS.

Very early on the morning of the 11th a Wabash, St. Louis & Pacific shifting engine ran into a Chicago, Rock Island & Pacific freight train at the crossing at Forty-fifth street in Chicago, Ill. The engine and two cars were badly broken, the engineer and fireman hurt.

On the afternoon of the 11th a passenger train on the Pennsylvania Railroad ran into a freight train which was crossing the main track at East Newark, N. J. Three freight cars were wrecked and the passenger engine damaged.

About noon on the 29th a Cleveland, Columbus, Cincinnati & Indianapolis freight train ran into a Columbus, Hocking Valley & Toledo freight at the crossing in Marion, O., wrecking three cars.

On the afternoon of the 30th a Lehigh Valley freight train ran into a Pennsylvania Railroad freight at the crossing of the two roads in Perth Amboy, N. J. Both engines were wrecked, an engineer and both firemen badly hurt. It is said that the reflection of the sun from the crossing signal prevented the Lehigh Valley engineer from seeing it.

#### DERAILMENTS, BROKEN RAIL.

On the morning of the 21st the engine and one car of a passenger train on the Pittsburgh, Cincinnati & St. Louis road were thrown from the track near Richmond, Ind., by a broken rail.

On the night of the 21st several cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track near Logansport, Ind., by a broken rail.

#### DERAILMENT, BROKEN SWITCH-ROD.

On the night of the 25th the engine and several cars of a freight train on the Raleigh & Augusta Air Line were thrown from the track near Hamlet, N. C., by a broken switch-rod. Two trainmen were hurt.

#### DERAILMENTS, BROKEN BRIDGE.

On the morning of the 3d a passenger train on the Central Branch road went through a bridge at Granite Creek, Kan., which had been partly burned during the night. The engine and baggage car went down, killing the engineer and fireman and injuring two other trainmen.

On the evening of the 6th a bridge over the Embarras River near Greenup, Ill., on the Peoria, Decatur & Evansville road, gave way under a freight train, the engine and 18 cars going down. A trainman was killed and two others hurt.

On the night of the 16th a freight train on the Chicago, Burlington & Quincy road broke through a small bridge near Ferris, Ill., and six cars went down and were wrecked. A brakeman was killed.

On the 30th the bridge over North River near St. Rose, P. Q., on the Canadian Pacific road, gave way under a freight train, and five cars went down into the river. The bridge was of iron and nearly new.

#### DERAILMENTS, SPREADING OF RAILS.

On the morning of the 1st a freight train on the Scioto Valley road was thrown from the track near Kinnikinnick, O., by the spreading of the rails.

On the morning of the 2d a lumber train on the East Tennessee, Virginia & Georgia road was thrown from the track near Locust Grove, Ga., by the spreading of the rails on a high bank. The train was wrecked and seven trainmen hurt.

On the morning of the 2d a construction train on the Canadian Pacific road was thrown from the track near Shelby, Man., by the spreading of the rails. The conductor was badly hurt.

On the night of the 8th two cars of a freight train on the Chicago & Northwestern road were thrown from the track in Evanston, Ill., by the spreading of the rails.

On the evening of the 10th a construction train on the Minneapolis & St. Louis road was thrown from the track near Waseca, Minn., by the spreading of the rails. The caboose was wrecked and 35 laborers hurt.

Very early on the morning of the 18th a passenger train on the Louisville & Nashville road was thrown from the track near Pensacola Junction, Ala., by the spreading of the rails. The conductor was slightly hurt.

On the morning of the 30th a freight train on the St. Louis, Iron Mountain & Southern road was thrown from the track near Little Rock, Ark., by the spreading of the rails. Several cars were wrecked, a brakeman killed and the conductor hurt.

#### DERAILMENTS, BROKEN AXLE.

On the evening of the 7th nine cars of a coal train on the New York Central and Hudson River road were thrown from the track near Tennett, N. Y., by a broken axle.

On the 17th several cars of a freight train on the Pennsylvania Railroad were thrown from the track near Mountville, Pa., by a broken axle.

On the afternoon of the 20th several cars of a freight train on the Great Western Division of the Grand Trunk road were thrown from the track in the tunnel near Clifton, Ont., by a broken axle, and 10 cars were piled up in the tunnel, making a wreck very difficult to remove.

On the evening of the 30th a car of a passenger train on



the Bath & Hammondsport road was thrown from the track near Pleasant Valley, N. Y., by a broken axle. The car upset, injuring five passengers.

**DERAILMENTS, BROKEN WHEEL.**

On the morning of the 8th 14 cars of a freight train on the Southern Pacific road were thrown from the track near San Gabriel, Cal., by a broken wheel.

On the morning of the 23d several cars of a coal train on the New York, Lake Erie & Western road were thrown from the track near Griswold, N. Y., by a broken wheel.

**DERAILMENT, BROKEN TRUCK.**

On the morning of the 16th a car of a passenger train on the Natchez, Jackson & Columbus road was thrown from the track near Adams, Miss., by a broken truck.

**DERAILMENTS, WASH-OUT.**

On the morning of the 3d a passenger train on the Chicago & Northwestern road ran into a wash-out near Waukesha, Wis., and was wrecked, injuring three trainmen.

On the night of the 3d a passenger train on the Pittsburgh, Ft. Wayne & Chicago road ran into a wash-out near Canton, O., the engine and three cars going down into the gap.

On the night of the 3d a passenger train on the Lake Erie Division of the Baltimore & Ohio road ran into the gap where a small bridge had been washed out near Green Springs, O., and several cars were badly wrecked. One passenger was killed and nine hurt.

On the morning of the 4th a freight train on the Lake Shore & Michigan Southern road ran into a wash-out culvert near Fremont, O., and nearly the whole train went down into the creek and was wrecked.

On the morning of the 6th a freight train on the Indiana, Bloomington & Western road ran into a wash-out near London, O., the engine and two cars being wrecked.

**DERAILMENTS, ACCIDENTAL OBSTRUCTION.**

On the night of the 21st several cars of a freight train on the Buffalo, New York & Philadelphia road were thrown from the track near Holland, N. Y., by a broken brake-beam which dropped down on the rails.

Very early on the morning of the 23d four cars of a freight train on the St. Louis Tunnel road were thrown from the track in St. Louis, Mo., by some lumber which fell from a flat car in the train. Two cars were badly wrecked and the road blocked nearly 12 hours, the situation of the wreck in the tunnel making it very difficult to clear away.

On the afternoon of the 23d several cars of a passenger train on the Toledo, Cincinnati & St. Louis road were thrown from the track near Dayton, O., by a broken brake-beam, which dropped down on the rails.

On the afternoon of the 31st several cars of a freight train on the Chicago & Eastern Illinois road were thrown from the track near Bismarck, Ill., by some lumber which fell from a flat car on the track. A boy, who was stealing a ride, was killed.

**DERAILMENTS, CATTLE.**

On the morning of the 5th a freight train on the Virginia Midland road ran over a cow near Lynchburg, Va., the engine and six cars being thrown from the track. A brakeman was killed and another hurt.

On the evening of the 5th a freight train on the Wabash, St. Louis & Pacific road ran over a cow near Peru, Ind., and several cars were thrown from the track.

On the morning of the 7th a repair train on the Summit Branch road ran over a cow near Lykens, Pa., and was thrown from the track. Two men were badly hurt.

On the night of the 7th a freight train on the Kansas City, St. Joseph & Council Bluffs road ran over some cattle near Bigelow, Mo., the engine and 10 cars were thrown from the track.

On the morning of the 10th a repair train on the South Carolina road ran over a cow near Branchville, S. C., and the whole train was thrown from the track. The engineer was killed and five laborers hurt.

On the night of the 16th a passenger train on the Wabash, St. Louis & Pacific road ran over a bull near Keytesville, Mo., and two cars were thrown from the track and upset.

On the evening of the 24th a freight train on the Atchison, Topeka & Santa Fe road ran over a cow near Neosho Run, Kan. The engine ran across a bridge on the ties, the guard-rail keeping it from going off, and beyond the bridge it went off the track with six cars piled on top of it.

On the evening of the 25th a freight train on the St. Louis, Alton & Terre Haute road ran over a mule near Denny, Ill., and the engine was thrown from the track with ten cars piled up on it in a very bad wreck. The engineer was badly hurt, the fireman killed.

**DERAILMENTS, MISPLACED SWITCH.**

On the morning of the 14th the rear car of a passenger train on the Manhattan Elevated road was thrown from the track at the One Hundred and Twenty-fifth street station in New York by misplaced switch.

Near midnight on the 16th a passenger train on the Central Railroad, of New Jersey, was thrown from the track at Dunellen, N. J., by a misplaced switch.

On the night of the 20th the engine and several cars of a freight train on the New York & New England road were thrown from the track in Franklin, Mass., by a misplaced switch.

On the evening of the 25th nine cars of a freight train on the New York, New Haven & Hartford road were thrown from the track near New Haven, Conn., by a misplaced switch.

On the afternoon of the 26th the engine and two cars of a passenger train on the Chesapeake & Ohio road were thrown from the track in Lexington, Ky., by a misplaced switch.

On the morning of the 27th a gravel train on the New Haven & Northampton road was thrown from the track in Northampton, Mass., by a misplaced switch and ran into the wall of the round-house, knocking down a corner of the building.

On the night of the 30th a freight train on the Louisville, Evansville & St. Louis road was thrown from the track at Bradley, Ind., by a misplaced switch.

**DERAILMENT, FAILURE TO USE SIGNALS.**

On the afternoon of the 8th a freight train on the Cincinnati, Hamilton & Dayton road ran into a small stream at Kirkwood, O., and the engine and nine cars were wrecked. The bridge or culvert had been taken down for repairs, but the bridge-men neglected to put out a proper signal.

**MALICIOUS DERAILMENTS.**

On the morning of the 21st the engine and 10 cars of a freight train on the Louisville & Nashville road were thrown from the track at South Drake's Creek, Tenn., by a misplaced switch. The engine upset into the ditch. The switch is believed to have been purposely misplaced.

On the evening of the 23d a passenger train on the Boston, Concord & Montreal road struck a frog which had been laid across the rail, near Dark Hollow, N. H., and the engine and two cars went down a high bank and were badly damaged.

Early on the morning of the 24th a construction train on the New York, Chicago & St. Louis road was thrown from

the track in Erie, Pa., by a switch which had been purposely misplaced.

**UNEXPLAINED DERAILMENTS.**

On the morning of the 1st the engine of a passenger train on the Catskill Mountains road ran off the track and upset near Leeds, N. Y., injuring the engineer and fireman.

On the evening of the 2d a freight car on the Missouri Pacific road jumped the track in St. Louis, Mo., and ran against one of the columns supporting a street bridge over the track, knocking it down.

On the night of the 5th two cars of a freight train on the Pennsylvania Railroad were thrown from the track near Plainsboro, N. J., blocking two tracks an hour.

On the night of the 7th the engine and four cars of a passenger train on the Northeastern Railroad, of Georgia, ran off the track near Clarksville, Ga., and were damaged. The engineer, fireman and five passengers were hurt.

On the night of the 7th a freight train on the Boston, Hoosac Tunnel & Western road ran off the track near Valley Falls, N. Y., and five cars went down a high bank and were wrecked.

On the night of the 7th five cars of a freight train on the Central Railroad, of New Jersey, ran off the track near Pamapo, N. J., blocking the road two hours.

On the morning of the 8th several cars of a freight train on the Detroit, Mackinac & Marquette road ran off the track near Marquette, Mich., blocking the road two hours.

On the morning of the 8th two cars of a freight train on the New York, Central & Hudson River road ran off the track in Utica, N. Y., blocking one track two hours.

On the morning of the 8th two cars of a freight train on the New York Central & Hudson River road ran off the track in Rochester, N. Y., but little damage was done.

On the afternoon of the 8th a passenger train on the East Line & Red River road ran off the track near Winaboro, Tex., and several cars were wrecked. Three train men and a passenger were killed, and eight passengers hurt.

On the morning of the 14th a car of a construction train on the New York, Chicago & St. Louis road ran off the track near Warsaw, Ind. A laborer was killed.

On the morning of the 17th a repair train on the St. Louis, Iron Mountain & Southern road ran off the track near Benton, Ark., and the engine and 15 cars were piled up in a bad wreck. The conductor was killed.

On the morning of the 18th a construction train on the New York, West Shore & Buffalo road ran off the track at Washington Valley, N. Y., and knocked over a water tank. Two men were killed and two others badly hurt.

On the night of the 21st a freight train on the Vandalia Line was thrown from the track near Greenville, Ill., wrecking several cars, killing a brakeman and injuring two tramps.

On the afternoon of the 22d the engine of a passenger train on the Missouri Pacific road ran off the track at the Union depot in St. Louis, Mo., doing but little damage.

On the night of the 23d two cars of a freight train on the Lake Shore & Michigan Southern road ran off the track in Dunkirk, N. Y., and ran into the station wall. A section of the wall was knocked down and the cars badly broken.

On the afternoon of the 26th several cars of a coal train on the Delaware, Lackawanna & Western road ran off the track near West Winfield, N. Y., blocking the road three hours.

On the night of the 26th a car of a passenger train on the International & Great Northern road ran off the track at Texarkana Junction, Tex., and was thrown over against a freight train standing on a siding. A brakeman was caught between the cars and killed.

On the afternoon of the 28th a stock train on the Grand Trunk road ran off the track near Highland Creek, Ont., and nine cars went down a high bank and were wrecked, killing a large number of cattle.

On the morning of the 30th the engine of a freight train on the West Jersey road ran off the track in Millville, N. J., blocking the road two hours.

On the evening of the 30th a car of a freight train on the Boston & Maine road jumped the track in the yard in Boston, Mass. Careful investigation failed to show the cause of the accident.

**BOILER EXPLOSION.**

On the morning of the 7th the engine of a passenger train on the Chester & Lenoir road exploded its boiler while standing on the track at Mayden, N. C., waiting to go out with a train. The engine was torn to pieces, and the fireman killed. The fireman had started the fire and made the engine ready, and it is supposed that he had not seen that there was water enough in the boiler.

**OTHER ACCIDENTS.**

On the night of the 11th the engine of a passenger train on the New York & New England road broke a side rod when near Waterbury, Conn. The loose end broke one side of the cab and tore a hole in the boiler.

On the evening of the 24th a Terre Haute & Indianapolis yard engine broke an axle on the Union tracks in Indianapolis, Ind. The axle broke close to the hub of the driving wheel, and the wheel dropped off, twisting up the rods, but not derailing the engine.

On the afternoon of the 30th a crank-pin broke on the engine of a passenger train on the Intercolonial road when near Canaan, N. B. The loose coupling rod tore up the running-board and cab badly, injuring the fireman slightly.

**SUMMARY.**

This is a total of 139 accidents, by which 46 persons were killed and 218 injured, being a daily average of 4½ accidents, 1½ killed and 7 injured.

Twenty-six of the killed and 117 of the injured were railroad employes; 20 of the killed and 101 of the injured were passengers or others riding on the trains.

Of the whole number of casualties 143, or 54.2 per cent., were to employes, and 121, or 45.8 per cent., to passengers.

For the eight months of 1882 there have been reported 802 accidents, 234 killed and 982 injured, a monthly average of 100 accidents, 29 killed and 123 injured.

**Master Car-Painters' Convention.**

The thirteenth annual convention of the Master Car-Painters' Association opened in Chicago, Sept. 20. President Robertson called the meeting to order at noon.

A short address of welcome was made by Acting-Mayor Heath, who extended to the members the hospitality of the city of Chicago.

Invitations were presented to visit the shops of the Chicago & Northwestern and the new Pullman shops.

President Roberts then delivered a short address, in which he enjoined the members to freely express themselves on any of the topics that might come up for discussion, and not to think that they "knew it all," but to be willing to receive freely and profit by the suggestions of others. They must bear in mind the objects of the association—that they met for business and not merely for a social time.

The roll was called by the Secretary, and the following gentlemen responded:

R. W. Taylor, St. Paul, Minneapolis & Manitoba.  
G. Woodruff, Chicago.  
J. F. Sutton, Indiana, Bloomington & Western.  
John Josephham, Pittsburgh, Ft. Wayne & Chicago.  
Sam. S. Snyder, St. Louis, Pullman's Palace Car Co.  
Jos. Murphy, Louisville & Nashville.  
Wm. Amerson, Chicago & Northwestern.  
John Rattenbury, Chicago, Rock Island & Pacific.  
J. Heymer, New York.  
Jas. F. Cockburn, Pittsburgh, Cincinnati & St. Louis.  
C. F. Harrah, Kansas City, St. Joseph & Council Bluffs.

Nelson Nebr, Wabash, St. Louis & Pacific.  
Jno. G. Phillips, New York, Ontario & Western.  
D. D. Robertson, Michigan Central.  
Chas. D. Ettlinger, Cleveland, O.  
Chas. B. Sharon, Newark, N. J.  
F. Bereman, Wisconsin Central.  
Wm. Davis, Canada Southern.  
A. J. Bishop, Cleveland, Columbus, Cincinnati & Indianapolis.

H. A. Quackenbush, Chicago.  
J. C. Stout, Union Pacific.  
T. J. Raunbaub, Pittsburgh, Ft. Wayne & Chicago.  
Fred. S. Ball, Pennsylvania.  
H. A. Queensbough, Lake Erie & Western.  
J. C. Congdon, Northern Pacific.  
W. T. Sutton, Flint & Pere Marquette.  
John B. Cox, Boston.  
George Forby, Missouri Pacific.

A. P. Sweet, Delaware, Lackawanna & Western.  
A. D. Keys, New York.  
F. M. Widmer, New York, Lake Erie & Western.  
Parker Grace.  
R. McKeon, New York, Pennsylvania & Ohio.

E. M. Billings, Pittsburgh, Cincinnati & St. Louis.  
B. F. Harris, Cleveland, Akron & Columbus.  
L. Schaub, Sioux City & Pacific.  
Wm. Lewis, Grand Trunk.

Wm. Sharp, Lake Shore & Michigan Southern.  
C. E. Felch, Southeastern, of Canada.  
W. J. Russell, Grand Rapids & Indiana.  
J. H. Wills, New York Central & Hudson River.  
G. O. Widmer, Lake Shore & Michigan Southern.

W. L. Eneart, Detroit, Berry Brothers.  
John Roney, Credit Valley.  
Wm. Stines, Barney & Smith Manufacturing Co.  
D. C. Cooley, Aurora, Ill.

Wm. G. Baker, New York.  
The report of Mr. R. McKeon, Secretary and Treasurer, showed an increase of 14 members during the year, making 83 now on the roll. He suggested the adoption of a standard system of painting cars, which could be adopted by all shops.

On motion, this suggestion was referred to a special committee, consisting of Messrs. Stines, Ball and Billings. The election of officers being next in order, the old officers were all chosen to serve for another year, as follows: President, D. D. Robertson; Vice-President, John Rattenbury; Secretary and Treasurer, R. McKeon.

The convention then took up the first subject for discussion: "What is the best method of filling and finishing light-colored woods so as to preserve the color in its natural state as much as possible?"

This was discussed at length by Messrs. Stout, Congdon, Stines, Wills, Billings, McKeon and Cooley.

At the close of the discussion the convention adjourned until next day. After adjournment the members paid a visit to the extensive shops of the Chicago & Northwestern road.

**SECOND DAY.**

At the opening of the convention the first question taken up was: "When the paint on a panel is in a condition to blister, why does it not blister all over, in place of being limited to a few spots, which is the usual case?"

Mr. Forby read a few notes on this subject, and the discussion was continued by Messrs. Sharp, Nebr, Amerson, Felch and others, the general opinion being that moisture was the cause of the blistering.

Mr. Felch then read an interesting paper on "Surface Painting."

The convention then took up the fourth question: "What advantage is there, if any, in striping, lettering and decorating on bare color, instead of giving a coat of varnish previously?"

The discussion was opened by Mr. Stines, and continued by Messrs. Ball, McKeon, Cooley, Nebr, Billings, Rattenbury and others, most of the speakers advocating striping on bare or flat color.

Mr. Mills then read a long and elaborate paper on the question: "What are the benefits resulting from the use of ready-mixed or prepared colors in the railway shops?"

He considered the questions of uniformity, economy, durability and the responsibility of manufacturers, generally advocating the use of prepared colors.

The essay was discussed by Messrs. Stines, Stout, McKeon, Billings, Ball and Rattenbury. At its close the following resolution was offered:

"Resolved, That in paint shops where the necessary facilities can be obtained it would be more economical if the painters could grind their own colors instead of using the prepared colors sold by color-grinders."

The resolution was lost by a vote of 17 to 13, some members not voting either way.

The committee appointed by the Chair to consider the proposition to establish a standard of car-painting reported advising the appointment of a committee on this subject, to report at the next annual meeting of the Association. They also reported favorably upon the question of creating an Advisory Committee, whose duty it should be to answer any inquiry which might be made by members in regard to the matters pertaining to the profession, and that the expense of the committee, if any, should be paid out of the funds of the Association.

The report was received and placed on file. A committee to select a place for the next meeting was appointed, and several resolutions of thanks passed. The convention then adjourned until next day.

After adjournment the members were taken in carriages to visit the parks and other places of interest. In the evening many of them attended the theatres, by invitation.

**THIRD DAY.**

After the opening of the convention, the first topic considered was "The most approved method of keeping passenger-cars clean and the best material for washing them on the outside when in service with the least injury to the varnish."

The subject was opened by D. D. Robertson, and fully discussed by him and others.

"Practical thoughts on locomotive painting" was the theme of a paper written by J. S. Atwater, of Boston.

The paper evoked pertinent observations from Messrs. O'Neill, Stout, Phillips, Cooley and others.

The convention then proceeded to ballot for the place of holding the next convention. Baltimore was chosen.

Mr. A. P. Sweet read a paper on the topic: "Wherein lies

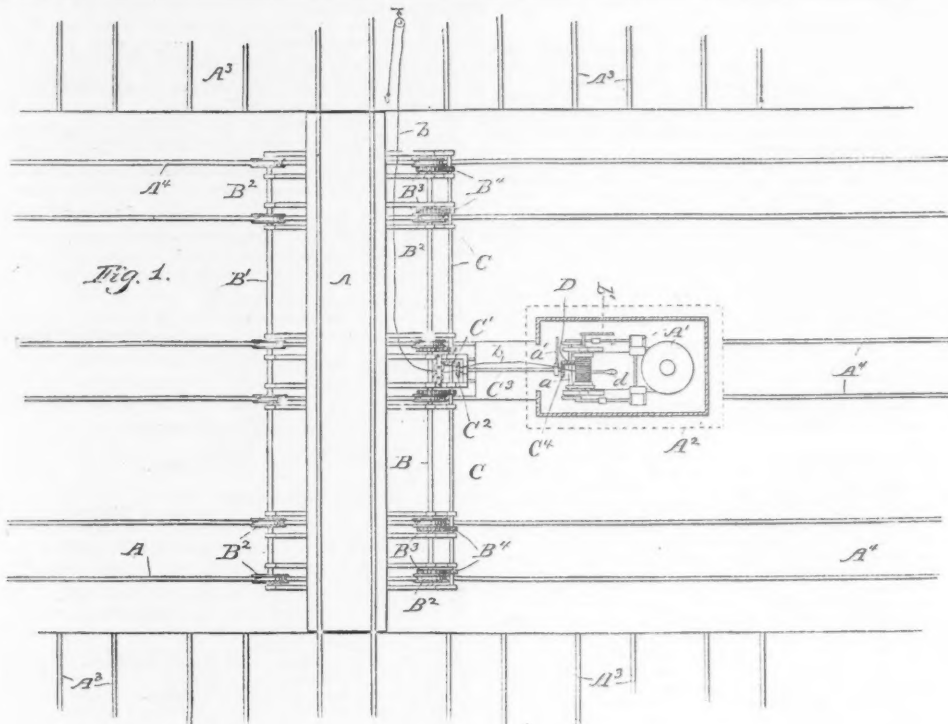
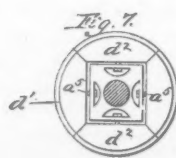
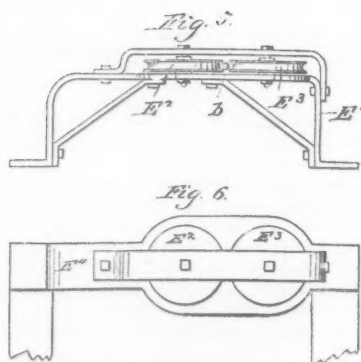
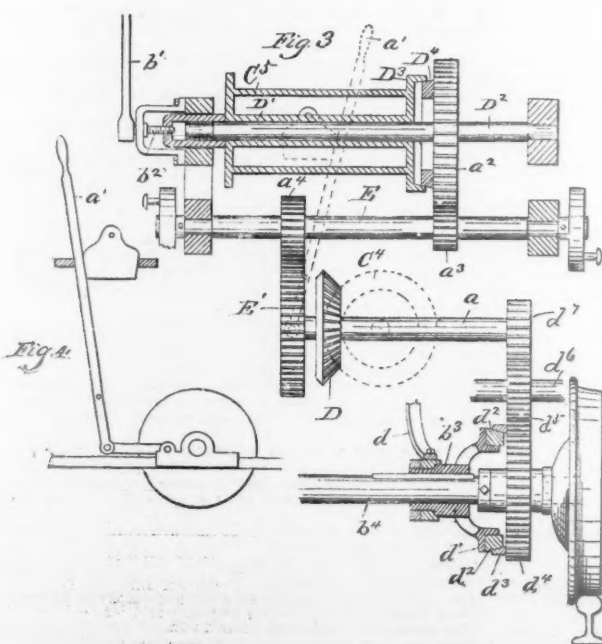


FIG. 2.



ROBINSON'S TRANSFER-TABLE.

the benefit of putting on two or three coats of finishing varnish on a coach body within 24 or 36 hours of each other in place of giving each coat a proper time to dry?"

This called out a long discussion, in which many members took part.

The next question was: "The most approved methods employed for removing old paint from passenger cars, also or removing cracked or decayed varnish from the inside finish of the car with the least expense and damage to the surface."

This was fully discussed by Messrs. McKeon, Congdon, Ball, Rattenbury and others.

The report of the special committee presented on the previous day having been taken up and its suggestions adopted, Messrs. Stines, Atterbury, Ball and McKeon were appointed an Advisory Committee to examine and pass judgment, whenever called upon, upon mixtures, methods, formulas, pigments, etc., for the benefit of the Association.

Messrs. Forby, Davis, and Emerson were elected as the committee to formulate a standard system of painting to report to the next convention.

After transacting the usual routine business, the Association adjourned, to meet in Baltimore next year.

After adjournment the members went to Pullman on a special train, and made a thorough inspection of the great shops there. In the evening they were entertained at a banquet, which was an exceedingly pleasant occasion for those present.

#### Robinson's Transfer-Table.

Mr. Norman W. Robinson, of Pullman, Ill., has patented some improvements in transfer-tables which he describes as follows in his specifications:

Fig. 1 is a top view embodying my improvement, showing the transfer-table and operating mechanism with a series of tracks leading off at both sides, the upper part of the car structure, enclosing the dummy-engine, being cut away in a horizontal plane. Fig. 2 is an elevation embodying my improvement, showing the relation of the cars, dummy-engine and depot buildings. Fig. 3 is a detached detail, partially in section, of the series of gear-wheels and intermediate shafts relative to the main or engine shaft and the axle of the dummy-engine car. Fig. 4 shows the position of the gear-shifting lever when the mechanism connecting the transfer-table and dummy-engine is out of engagement, and the dotted lines in fig. 3 show the position of the same when in gear. Fig. 5 is a side elevation of the drag-rope, guide-sheaves and supporting-bracket. Fig. 6 is a top view of the same, and fig. 7 is a detached view of the friction clutch-pulley feathered on to the car-truck axle of the dummy-engine.

Referring to the drawings, A represents the platform of the transfer-table proper; A^1, the dummy-engine; A^2, the car enclosing the same; A^3, a series of tracks communicating with the shops or depot buildings, and A^4, the transfer-table and dummy-engine tracks running at right angles to the tracks A.

As shown in the drawings, three sets of tracks are used or the transfer-table, the dummy engine being placed on the middle track. The mechanism of the dummy-engine is so arranged that the power may be applied to run cars on and off the transfer-table, while the car carrying the engine remains stationary; or, by the shifting of a lever, as will be explained further along, connection is made with the axle of the dummy car, and the position of the engine and transfer-table changed as circumstances may require.

On the shafts or axes B^1 of the transfer-table proper are placed the series of car-wheels B^2, upon which the transfer-table moves.

Upon the shaft B are placed a number of gear-wheels, B^3, which are adapted to engage with the series of pinions B^4 on the shaft C. This shaft C is also provided with the bevel gear wheels C^1, adapted to engage with the bevel-gear wheel C^2, on the shaft C^3, having on the opposite end the bevel-gear wheel C^4, engaging with the corresponding wheel, D, located on the intermediate shaft, a. By this arrangement power and motion are transmitted from the engine to the transfer-table, and the mechanism is thrown in and out of gear by means of the lever a'. The drum C^5 consists of the outer shell and the inner sleeve, D', enclosing the shaft D^2, as shown in fig. 3 of the drawings, and is made to rotate therewith by means of the clutch L^1, forming a part of the drum C^5, engaging with the annular shoulder L^2 on the gear-wheel C^2, which in turn engages with the pinion a^1, located on the crank or engine shaft E, carrying the pinion a^2, which engages with the gear-wheel E'. The drum C^5 receives the coil of the drag-rope b, and is thrown in and out of gear by means of the lever b', connected with the projecting end of the sleeve D through the medium of the screw b^2, as shown in fig. 3 of the drawings.

The lever d (shown in fig. 1 and broken away in fig. 3) serves to throw the engine mechanism in and out of gear with the front axle of the dummy-car, this lever being attached to the sleeve b^2, feathered onto the axle-shaft b^1.

Secured to the sleeve b^2 is the clutch-wheel d^1, carrying the wooden friction quadrants d^2, as more clearly shown in fig. 7 of the drawings, the bearing surfaces of which are cut away at an oblique angle, and when thrown in gear engage with the inner corresponding surface of the annular projecting rim d^3, formed integral with the gear-wheel d^4, which engages with the pinion d^5 on the intermediate shaft a^3, which in turn engages with the pinion d^6 on the shaft a^4, by which motion is transmitted from the main or crank shaft of the engine to the dummy-car wheels. The quadrants d^2, as they become worn are set out by the screw bolts u^2. (Shown in fig. 7 of the drawings.)

One end of the drag-rope b is attached to the drum C^5, from thence passing through the sheaves E^2 E^3, journal'd in the bracket E^4, then through the snatch-block F^1, and having on the outer end the hook F^2, adapted to engage with the body to be moved, the snatch block, through which the drag-rope is rove, being secured at any convenient point and shifted as may be necessary. By means of the double sheaves the drag-rope may be run off to either side of the dummy-engine to move the cars.

Fig. 2 shows the relation of the dummy-engine, cars and buildings.

What the patentee claims is:

1. In a transfer system, as described, the combination, with the transfer-table A and the shaft B, of the series of gear-wheels B^3, the pinions B^4, the shaft C, the bevel gear C^1 C^2, the shaft C^3, the bevel-gear C^4 D and the shaft a, substantially as and for the purpose set forth.

2. A transfer-table, substantially as described, adapted to traverse two or more sets of tracks, and provided with a series of bearing-wheels B^2, mounted in line along one side of said table, and gear-wheels B^3 E^3, severally connected with said bearing-wheels, combined with counter-shaft C, bearing pinions B^4 E^4, severally in engagement with said gear-wheels B^3, and dummy-engine mounted upon an independent carriage, but by means of shaft C^3 in connection with said counter-shaft C, whereby power is uniformly transmitted to each of said bearing-wheels independently.

3. A traveling transfer-table permanently connected to and operated by a dummy engine mounted upon a separate carriage, combined with a drag-rope and winding-drum operated by said engine independently of the traction-wheels,



and suitable guide-pulleys, whereby the cars may be drawn onto or off the transfer-table, as set forth.

4. The combination, with a dummy-engine and traveling transfer-table actuated thereby, of the drum  $C^2$ , provided with the clutch-box  $D^2$ , the drag-rope  $b$ , the sheaves  $E^2$   $E^3$ , and the bracket  $E^4$ , substantially as herein shown and described.

5. The combination, with the engine car-axle  $b^4$ , of the sleeve  $b^3$ , the clutch-wheel  $d'$ , the adjustable quadrant-blocks  $d^2$ , and the gear-wheel  $d^4$ , provided with the annular rim  $d^3$ , substantially as and for the purpose described.

It should, perhaps, be stated that transfer-tables have heretofore been operated in England by dummy-engine mounted on a separate carriage, combined with a drag-rope and winding-drum operated independently of the traction-wheels. Such an arrangement was in use at the Midland railway carriage shops at Derby last summer, when the writer visited these works. How long it had been in use he is not able to say, but it was not new when he saw it.

### Contributions.

#### The Association of American Railroad Superintendents.

TO THE EDITOR OF THE RAILROAD GAZETTE:

While the practical utility of the multiplication of technical associations may well be questioned, there can be no reasonable doubt that those associations will be valuable which make use of their meetings for the mutual interchange of views and experiences, and for the discussion and adoption of uniform methods and appliances. The results attained by these discussions will be the measure of the association.

The Association of American Railroad Superintendents, which meets at No. 46 Bond street, New York, Oct. 18, will enter upon its second year with a membership of about one hundred. It has already accomplished good work by its discussion of the question of signals, the code considered at its last meeting having been already adopted by many roads, although the Committee on Rules and Signals have not made their final report.

If the association can receive the cordial and general support of railroad superintendents, and have its meetings well attended, its success is assured, and its discussions and conclusions cannot fail to be of great interest and benefit. It is not enough, however, that the association have a large membership. Its members must take a lively interest in the meetings, and give them, if possible, the benefit of their presence. At the coming meeting in particular the co-operation of the members is especially desirable to give the conclusions arrived at the weight which their importance demands.

MEMBER.

#### Papers on Painting.—No. 21.

BY CHARLES L. CONDIT.

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##### PAINTING IRON.—NO. 1.

It is plain, therefore, by the facts stated in the last article, that we must discriminate in painting metal as to what we shall do in the way of preparation. It will also become evident that it is well to discriminate in the choice of our paint.

**Cast Iron.**—Cast iron does not rust rapidly, but in salt water softens and becomes a sort of plumbago. It should be painted or dipped in hot oil as soon as it leaves the mold, in order to preserve the hard skin before it is acted upon by the air.

If the least rusted, the rust must be removed by scraping or brushing with wire brushes.

**Wrought Iron.**—The black scale or rust on wrought iron must be removed. It is not necessary to remove all the black scale, and indeed it is a very difficult thing to do. Mulder who investigated the painting of iron for the Dutch government found that a piece of iron from which he had with great difficulty removed this scale rusted quickly while the piece on which the black scale had been left was quite free from rust. One will often observe pieces of old wrought iron quite clear of rust from no other protection than this scale.

We know that the scale itself is of different kinds; that produced by superheated steam, for example, being, as we have said, the best and only sure protection, while the ordinary scale to a large percentage gradually falls off, from (apparently) the formation of a minute quantity of rust powder under it.

It is worth while, therefore, to study the varieties of this (black) scale, for there is without doubt a difference between that formed in the ordinary conditions of the air, in water, under the beating hammers, etc. This study we must, however, leave the reader to make for himself, warning him only that all ordinary scale (black) is of an unreliable character, in the fact, apparently, that it can give up oxygen to the iron beneath it, and so form crumbling rust of the very stuff by which it is held to its bed. It may be painted, and the paint will hold fairly well for a time, if undisturbed, yet when the paint is scraped the scale will come with it; and this is a method sometimes used to get rid of it on ship iron. A light coat of paint is put on, which, after a year, is scraped off, carrying the scale with it and leaving a solid surface for permanent painting. The scale may be removed in several other ways.

(1.) It may be allowed to rust off, and the iron may then be scraped with wire brushes. The objection to this method is the same as that against allowing your garden to get full of grown weeds in order to pull them with ease. In either case your antagonist may prove too strongly planted.

(2.) The iron may be pickled in a bath of one part of sulphuric acid to 100 of water; or washed with a solution of 8 parts of acid in 100 of water; after which well scraped with wire brushes, and rewashed with lime water. Acid is

only allowable where it can be thoroughly neutralized with lime water.

**Steel.**—Recent English experiments on steel (using a galvanometer) give evidence that the "pitting" of steel is partly due to the galvanic action between the black scale and the body of the steel.

I have not seen the records of the original investigation, but Mr. White, of the Admiralty office (*Journal of the Iron and Steel Institute*, 1881):

"That was not a speculative belief, but a belief based upon experience and many careful experiments made under water in Portsmouth harbor. The trials were made with the greatest care under the most varied conditions, and the results made it as certain as one would be certain about anything that the black oxide, if left on portions of steel plates, would cause pitting of the bare surface of the plates. Active galvanic action could be traced with the galvanometer on the parts of the plates from which the scale had been removed. There was all the difference in the world between corrosion and pitting \* \* \* as the Admiralty experiments proved. Mr. Parker had shown that there might be practically no corrosion on clean surfaces (steel) during very long periods, but if a hole was formed in the plate by pitting, it became a serious matter. In the Royal Navy they were trying to get rid of the black oxide by means of pickling before being worked: \* \* \* plates were also being dealt with by a \* \* \* process which had not been perfected. \* \* \* In the private trade, where ships were built in the open air and exposed to the weather, he believed there was less difficulty in getting rid of this scale than in the case of the Admiralty ships which were built under cover. The danger was that they might have some local part to which the scale adhered after all care had been taken. In the case of the *Iris* and the *Mercury*, great care had been taken \* \* \* but when the *Iris* had been on service in the Mediterranean a few months, it was found that the effects of the scale were visible.

In the paper referred to by Mr. White, Mr. Parker says:

"We have, at the present time, 1,100 marine steel boiler-running, \* \* \* and the accounts I have received down to the latest go to show that steel boilers behave in respect to corrosion about as well as iron boilers. Greater irregularity in the corrosion of the steel is reported, and I am inclined to the belief that this is due even to a greater extension in my experiments to the unequal action of the scale, and if it should be found necessary to remove the scale, the difficulties in the way would not be great, and much irregularity and pitting would doubtless be removed."

**Priming Iron.**—Having rid the iron of all but fast-hard rust, the question of a priming arises. Nothing can be done by any paint except water-proofing. Paint can have no influence on iron except to rust it by acids, or else to keep its surface free of water. The chief thing is to get the water-proofer to stick. (1.) On smooth iron surfaces, oil loses its soft, not-drying acids and dries up: on rougher surfaces, it holds to iron quite as well as to wood, but (2.) on all surfaces with black scale, the scale may leave the iron and carry the paint with it. Besides, there are only two other difficulties in painting iron. (3.) The rust may spread under the paint from any point. (4.) The paint which will stick to the iron best will most readily crack or open the coats above it.

Taking up the last difficulty (4) first, we find that cracking of paint on iron and the wrinkling and crumpling up of paint come mainly from too thick a coat. Nothing will stick to iron better than boiled oil, because it is (a) sticky, (c) so tight underneath when dry, (d) elastic, so that it holds together well. The objection to it, however, is that it is too thick—it leaves so thick a covering that it wrinkles and may crack any over coat.

**Painting Cast Iron.**—Cast iron usually has such a rough surface and so many pores that there is no great difficulty in making paint stick to it, if the rust does not get planted underneath. When such an accident occurs the only remedy is to scrape off the paint and rust at that point, and repaint the spot.

It seems to the writer that it is for want of this distinction between the condition of the surfaces of irons (cast and wrought iron) that there is some confusion of views about methods of protecting them. Both have this difficulty, which no paint of any kind can overcome, that the rust spreads from any point under the paint. On both (exposed to the sun) the hot iron and the sun combined drive off the not-drying oil acids which keep the dry paint soft: the paint layer becomes hard and brittle.

Here, however, the two surfaces differ. The cast iron has a rough surface, and if promptly and properly painted is not inclined to scale. The scaling of the black oxide from the wrought iron carries the paint with it. Wrought iron needs a paint hard and elastic, which will hold itself together even if points of scale gives away underneath it: hence, the value of red lead on wrought iron; while on cast iron, other paints, iron oxides for example, will serve quite as well. The following experiment was made under the auspices of the Dutch State Railroads.

Iron plates were prepared for painting, as follows:

Sixteen plates (Nos. 1 to 16), pickled in acid (hydrochloric), then neutralized with lime (slaked), rinsed in hot water, and while warm rubbed with oil.

Sixteen plates (Nos. 17 to 32), were cleared of scale (so far as it could be removed) by brushing and scraping. Four plates from each set were then painted alike, for example, Nos. 1 to 4 and 17 to 20, with coal tar; Nos. 5 to 9 and 20 to 24 with iron oxide A; Nos. 10 to 13 and 24 to 28 with

\* These are the chief difficulties, but Dr. Widerhold maintains after a considerable study of iron surfaces that there is another one, which he apparently regards as the principal one. He claims that unless the priming color dries quickly, or if turpentine is used, the cooling of the iron (as at night or by the rapid evaporation of the turpentine) causes a deposit of dew like moisture upon the paint. This moisture forms an "emulsion" with the paint, and it does not dry into a homogeneous mass. His idea seems to be that paint dries under the influence of water on its surface, leaves little holes to the iron, or else that it more easily peels. I am unable to give the value of this result, but do not, myself, have any great confidence in it, but give it as the conclusion of one who claims to have made a study of the subject. I have not observed the rings caused by drops of rain on fresh paint to be centres of rusting.

iron oxide B; and Nos. 14 to 16 and 28 to 32 with red lead.

They were then exposed for three years, with the following results:

Paint.	On scrubbed plates.	On pickled plates.
Coal tar.....	Quite gone.	Inferior to the others.
Iron oxide A.....	Inferior to other two.	Holds well.
" " B.....	Superior to A; inferior to red lead.	" "

Red lead.....Equally well on both, and superior to all.

It is seldom that we can obtain so clear a record covering so long a period as this; but how shall we explain it, what in other words are the differences between the surfaces and between the paints? Pickling takes off quite all of the black oxide; scrubbing does not. Red lead unites with oil to form a hard oxy-linseed-oil-acid soap—a harder soap than given by any other combination. Says Mulder of boiled oil and iron oxide, boiled oil and litharge, boiled oil and zinc white, and boiled oil and red lead: "The lead when dry contained the largest amount of oxy-linseed-oil-acid lead, and was harder than the others."

It seems to me, therefore, that the best interpretation of the facts is the simplest, namely, the difference in the plates is the scaling off of the black oxide on the scrubbed plates; the difference in the paints, that the red lead did not give way when this scaling occurred, because it is a hard, elastic layer of paint, which holds itself together by its own cohesion.

**Further Testimony.**—This result in the above experiment was not, however, exceptional. The testimony to red lead is almost universal.

Prof. Henry L. Colton writes to the *Scientific American* that after three years' experience, with unlimited resources for experiment at his disposal, he finds nothing equal to red lead for ship iron.

An instance comes from England of pump rods, in a well 200 ft. deep, which had stood 45 years painted with red lead. At the expiration of that time their weight was found to be precisely the same as when new—no loss by rust.

Nearly every country of the world can furnish testimony of the same kind; but some people must have a thing happen in their own back yard with nobody by to make an exact record, or else, "it's all theory."

**Disadvantages of Red Lead.**—Red lead is adulterated with brick dust and other substances, and in this way has lost, perhaps, some of its good reputation.† Its value is that it unites with the oil, giving up at the same time a part of its oxygen. No other substance which does not unite with oil can replace it. Its value is its effect on the oil acids. Partly on account of this effect, it is said at times to blister badly. Spon says that should chemical action commence, red lead blisters, and is reduced to metallic powder. This is possible,‡ and it is also probable that red lead under great heat will blister sooner than iron oxide paint; and part of the reason is plain: it is more elastic. Elasticity in paint, as we shall show in another article, comes from the not-dried-up oil acids.

Red lead has also been accused of forming a battery with iron, and rusting the iron faster by unliking the oxygen in water (see last article).

No evidence within my knowledge as to the effects of dried red lead paint upon iron has appeared except as to the effects upon two vessels, and on these below their water line. The paint on the hulls of the ships "William Fairbairn" and "Guienne," painted with red lead, was found (under the water line) blistered, and in these blisters were metallic lead and chloride of iron from the effects of the battery made by the lead and iron on the sea water.

But Jouvin, who reports the case of the "Guienne," says that above the reach of the sea water wherever the red lead was in good condition it had done no injury. In fact, we cannot be sure that even in this case all the trouble may not have come from painting the vessel while wet. Our government vessels are painted with red lead and zinc; but the favorite paint for ships' bottoms is the merchant marine is, I believe, red lead alone. Red lead gives with zinc a very hard paint. Red lead softens tin, and has been accused of eating holes in it; this is not probable. It should not, however, perhaps be used on tin. The tin of a cup containing red lead paint can be easily scraped with a knife, its surface coming off in thin "shavings."

Finally the color of red lead is not durable, especially not with white lead. Under the action of the sun it becomes less orange; and mixed with other tints or under the influence of sulphur gas its color is fugitive.

(TO BE CONTINUED.)

### THE SCRAP HEAP.

#### Off the Track and On Again.

Between midnight and 1 o'clock on the morning of Sept. 13, as a through freight train on the New York & New England road was passing east through Bristol, Conn., the caboose jumped the track and the conductor, S. C. Hoffman, was thrown from the platform under the wheels and killed. The jolting of the caboose put out the lights, and the engineer, supposing that the train had broken in two, put on steam, to keep out of the way of the cars which he thought were detached, the train being then on a down grade. In this way the caboose was dragged for half a mile over the ties until it reached a roadcrossing, where it jumped back on the track again. The train ran a quarter of a mile further before it stopped. It is said that the speed at which the

\* From an analysis of this paint by Mulder, it is probable that it contained more clay than the other.

† In Europe it is also adulterated with colcotha (English red), made from refuse iron in the manufacture of sulphuric acid, and therefore quite certainly contains sulphuric acid, which would of course be very injurious to the painted iron.

‡ A master ship painter of very large experience tells me that blistering does not take place unless the vessel is painted while wet, or its iron more or less covered by scale.



caboose was hauled over the ties was about 15 miles an hour.

#### Provision For Accidents.

The Pennsylvania Railroad Co. is supplying all its trains with appliances to be used in cases of personal injury from accidents on the line of the road. The box which the company has decided on as the best for this purpose is of tin, about 8 in. in length, 4 in width and 2 in height, and is to be fitted into a chest on the tender. They were designed by surgeons of the company. On the cover is the following:

#### PENNSYLVANIA RAILROAD. Medical Box.

To be kept on each locomotive, and used in case of accident only.

#### Outfit.

1 rubber compress, 1 package of absorbent cotton, 6 rolls of bandages, 1 pyramid of pins.  
This outfit must always be kept up, and when any thing is needed requisition should be made at once.

#### Directions.

When an arm or leg is crushed, causing hemorrhage, pass compress around limb immediately above the injured part. In case of rupture, if a vein, tying it lightly until arrival of surgeon.

The rupture of an artery can be distinguished by the color of the blood, which is red and spurts out, while a vein has black blood and flows continuously.

For wounds on the head or face apply absorbent cotton and bind with a bandage.

#### Why She Asked Again.

"Won't you please tell me where the Closter train is?" asked a petite, handsome woman of a Hackensack man in the Jersey City depot of the New York, Lake Erie & Western Railway yesterday afternoon.

"You mean the Carlstadt train?" he gallantly suggested. "No, sir; that's what they all tell me. What I want is the train for Closter—C-l-o-s-t-e-r," she smilingly said. "Can you tell me where it is?"

"I can't say exactly, but"—  
Just here a big, burly, blue-coated official stepped up and, with a pompous air, exclaimed:

"I've told you four times where that train was."  
"Very true, sir," replied the polite little lady; "but you told me different every time."

The official wilted and shuffled off in despair, while the lady found the train.—*Hackensack Republican.*

#### An Exhibition Car.

The exhibition car of the Northern Pacific Railroad arrived Sept. 22 at Hannibal, Mo., from Burlington, Ia., and was visited by a large number of people. The car contains about 900 samples of products of the country from Duluth to Portland, Oregon, along the Northern Pacific road, through Minnesota, Montana, Dakota, Oregon, and Washington, and also a collection of vegetables, precious stones, photographs of scenes, heads of buffaloes and antelopes, etc. The car will go from Hannibal to Galesburg, thence to Peoria, where it will be exhibited at the Illinois State Fair, and from there East to all principal cities, returning via Louisville, Ky.

#### News Agents.

Mr. James McCrea, Manager of the Pittsburgh, Cincinnati & St. Louis road earns the gratitude of the public by issuing the following, which, it is to be hoped, will be copied—and enforced—by managers of other roads:

**RULES FOR THE GOVERNMENT OF NEWS AGENTS.**  
"Until otherwise ordered, the news agents upon the trains of this company will be governed by the following rules, and conductors of trains are hereby informed that they will be held personally responsible for the carrying out of these instructions:

"First—News agents must be neat and clean in their person and dress, polite to passengers and others with whom they come in contact, and in all manner of deportment. While on duty on the train, they will be subject to the discipline of the conductor thereof. Only one news agent will be allowed on each train.

"Second—While soliciting sales they shall not be permitted to individually importune or annoy passengers, but may announce, in a moderate tone of voice, at intervals, not exceeding four times in each car, the articles offered for sale.

"Third—They shall not be permitted to deposit their papers, books, etc., on the seats of cars or in the laps of passengers.

"Fourth—They shall not carry with them more than one trunk, which must be placed on the train in the baggage car or such other location as may be designated by the conductor, not less than 10 minutes before the departure of the train, and must not be removed from its assigned position on the train at the end of its run until after the passengers have alighted from the cars.

"Fifth—Conductors of through trains will not permit news agents to pass through the sleeping cars oftener than once every hour, and never when the berths are down, or passers get out for meals.

"Sixth—No preference shall be given or influence exerted in behalf of or against any newspaper, but an effort shall be made to furnish such as are called for in proportion to the demand for each."

#### ANNUAL REPORTS.

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Chicago, R. R. & Pacific	310, 420	Oregon Ry. & Navigation Co.	458
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Cin. Hamilton & Dayton	371	Pacific Mail Steamship Co.	370
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Concord	328	Perkiomen	71

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Connecticut River	70	Philadelphia & Reading	7, 20
Consolidation Coal Co.	193	Philadelphia, W. & Balt.	22
Cumberland Valley	217	Pittsburgh & Castle Shannon	142
Delaware	34	Pittsburgh, Cincinnati & St. L.	262
Delaware & Hudson Canal	101, 170	Pittsburgh & Lake Erie	93
Delaware, Lacka. & West	71	Portland & Ogdensburg	96
Del., Lack. & W. Leased Lines	340	Portland & Rochester	126
Delaware Western	41	Providence & Worcester	245
Denver & Rio Grande	71, 314	Pullman's Palace Car Co.	549
Des Moines & Ft. Dodge	101	Queen Anne's & Kent.	384
Detroit, Grand Haven & Mil.	494	Richmond, Fred. & Potomac	216
Detroit, Lansing & No.	496	Rochester & Pittsburgh	6
Eastern R. R. Association	281	Ruby Hill	324
Eureka & Palisade	324	Rutland	483
Fitchburg	40	St. Johnsbury & Lake Cham.	510
Florida & West Texas	195	St. L., Alton & Terre Haute	550
Galveston, Har. & San An.	466	St. Louis & San Francisco	175
Georgia	340	St. L., Vandalia & Terre Haute	484
Grand Rapids & Indiana	324	St. Paul & Duluth	217
Grand Trunk	323	St. Paul, Minn. & Manito.	191
Great Western	281	Sandy River	190
Hannibal & St. Joseph	170	Savannah, Florida & West	217
Han. J. N. Hanover & Gettysb.	354	South Carolina	189
Houston & Texas Central	136	South Carolina Minor R.R.	7
Huntingdon & P'd. Top Mt.	101	Southern Pacific	450
Illinois Central	99, 135	Sussex	386
Indiana, Bloom. & West	42	Terre Haute & Indianapolis	483
Indianapolis & St. Louis	343	Terre Haute & Logansport	484
Iowa Minor Railroads	71	Texas & Pacific	509
Jackson & Breakwater	315	Troy & Greenfield	70
Kan. City, Ft. Scott & Gulf	310	Union Pacific	175
Kan. City, Lawrence & So. Kan.	488	United New Jersey	191
Kentucky Central	195	U. S. Rolling Stock Co.	142
Knox & Lincoln	142	Utica & Black River	70
Lake Shore & Mich. St.	279	Vermont Valley	403
Lehigh Coal & Navigation Co.	126	Vicksburg & Meridian	490
Lehigh Valley	41, 190	Virginia Midland	142
Little Rock & Ft. Smith	310	Virginia & Truckee	70
Long Island	71	Wabash, St. L. & Pacific	94, 218
Louisville, Cin. & Lexington	51	Western Maryland	7
Louisville & Nashville	450	Western R. R. Association	38
Louisville, New Alb. & Chi.	142	Wilmington & Northern	436
Manchester & Lawrence	340	Worcester & Nashua	55
		Wisconsin Central	370

#### Northern Pacific.

On Sept. 5, 1882, the completed lines of this company were as follows:

Eastern Division, Main Line:	Miles.
Superior City, Wis., to end of track in Montana	909.0
Thompson Junction to Duluth, Minn. (one-half owned)	24.0
Brainerd, Minn., to Sauk Rapids (controlled)	60.5
Sauk Rapids to St. Paul (leased)	75.5
<b>Western Division, Main Line:</b>	<b>1,069</b>
New Tacoma, Wash. Ter., to Kalama	105
New Tacoma to Wilkeson	70
Wallula Junction, Wash. Ter., to Thompson Falls, Mon.	325
<b>Eastern Division, branches:</b>	<b>480</b>
Wadena, Minn., to Breckenridge and Pelican Rapids	80
Little Falls, Minn., to Morris	87
Casselton, Dak., north	43
Jamestown, Dak., north	35
Fargo, Dak., southwest	40
<b>Total</b>	<b>1,814</b>

At that date there was a gap of 485 miles from the end of track in Montana to Thompson Falls.

The average mileage worked for the year ending June 30, 1882, which is covered by the report, was 797 miles, against 584 miles in the previous year.

The equipment on June 30 consisted of 158 locomotives; 62 passenger, 7 sleeping, 1 dining, 29 baggage, mail and express cars; 1,734 box, 459 stock, 1 powder, 197 coal, 2,265 flat and 72 caboose cars; 1 pay, 3 business and 1 construction passenger car; 10 pile drivers, 1 accommodation and 338 boarding cars. Additions during the year were 54 locomotives; 40 passenger train cars; 2,065 freight cars and 18 service cars. There were 64 additional engines contracted for and under construction.

LIABILITIES.	
Capital stock:	
Common	\$40,000,000.00
Preferred stock	\$51,000,000.00
Less canceled by land sales	9,090,867.80
<b>Funded debt:</b>	<b>41,909,132.20</b>
Missouri Division bonds and certificates	\$2,500,000.00
Less canceled by land sales	76,100.00
<b>Pend d'Oreille Div. bonds and certificates</b>	<b>\$2,423,900.00</b>
Less canceled by land sales	3,561,600.00
<b>General first-mortgage gold bonds</b>	<b>\$20,000,000.00</b>
Undelivered	1,369,000.00
<b>Accounts payable and advances on general first-mortgage bonds</b>	<b>24,616,500.00</b>
Suspense account	7,051,551.74
Interest on funded debt: amt. due	59,410.69
Accrued, not due	\$7,203.32
<b>Net proceeds of land sales, in preferred stock, bonds and cash</b>	<b>661,676.74</b>
Profit and loss	10,432,643.24
<b>Total</b>	<b>\$136,989,498.00</b>

ASSETS.	
Railroad equipment and lands, including lines under construction	\$127,411,622.24
General supplies, including construction materials	4,250,059.89
Northern Pacific stock and other investments	2,236,235.10
Accounts receivable	740,922.16
Cash in hands of Treasurer	2,390,001.33
Cash in hands of Trustees derived from sales of land, for retirement of bonds	42,557.88
<b>Total</b>	<b>\$136,989,398.00</b>

The traffic for the year of the Eastern divisions only, the Pacific Division not included, was as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Passengers carried	297,680	352,914	144,768	94.7
Tons freight carried	34,329,018	15,246,589	19,082,429	125.2
Ton-miles	181,851,537	64,903,975	116,947,562	92.0

The average freight haul was 277.60 miles. Of the tons carried 74.07 per cent. were west-bound freight, and 25.93 per cent. east-bound. The average passenger journey last year was 115.30 miles. Of the passengers carried 54.9 per cent. were bound west, and 45.1 per cent. eastward.

The total number of passengers arriving at and departing from terminal points (St. Paul, Minneapolis, Duluth and Superior) was 106,886, an increase of 71,644 or 203.3 per cent.

The increase of traffic during the year has come from the settlement of the country on the line, from the extension of the road into the grazing region of Montana, and from the development of the coal region on the Pacific Division. Aside from the settlement growth of the country, new traffic

this year is expected from further developments of the coal regions, from the older Montana settlements which will soon be reached, from the shipments of lumber from the forest region in Washington Territory, and from the mineral regions about Lake Pend d'Oreille and in the Coeur d'Alene country.

The earnings for the year were as follows:			
	1881-82.	1880-81.	Increase.
Passengers	\$1,302,261	\$608,021	\$694,240
Freight	3,909,423	2,207,299	1,702,124
Mail	52,307	37,860	14,447
Express	149,293	76,319	72,974
Miscellaneous	17,022	4,420	12,602
<b>Total</b>	<b>\$5,430,306</b>	<b>\$2,964,519</b>	<b>\$2,465,787</b>
Working exps.	3,257,729	1,795,754	1,462,175
Rents and taxes	515,112	229,836	285,276
<b>Total</b>	<b>\$3,772,847</b>	<b>\$2,025,590</b>	<b>\$1,747,257</b>

Net earnings	\$1,657,465	\$938,929	\$718,536	91.7
Gross earn. per mile	6,319	4,723	1,596	33.8
Net	2,488	1,604	884	55.2
Per cent. working exps.	60.00	59.97		
Per cent. all exps.	65.80	67.04		

The expenditure for improvements and betterments of the old lines, not including construction of new lines, was \$1,185,944.70, the chief items being for steel rails, new shops at Brainerd, other buildings and grounds, new sidings and terminal improvements at St. Paul.

The amount expended for construction of new road during the year was \$15,044,712.75, and for new equipment \$2,138,956.26, a total of \$17,183,669.01 for extensions of the property.

The general income and revenue account is as follows:

Cash balance, July 1, 1881	\$11,567,944.33
Earnings	\$5,430,305.56
Land Department	1,464,661.87
Investments	47,212.16
<b>Total</b>	<b>\$18,490,123.92</b>

Proceeds of bonds	\$3,524,500.00
Preferred stock sold	1,157,586.65
Surplus earnings, advances on general mortgage bonds, and outstanding pay-roll checks	7,480,216.47
<b>Total</b>	<b>\$12,162,303.12</b>

Operating expenses	\$3,257,728.56
Interest and rentals	1,043,869.93
Taxes	113,275.13
<b>Total</b>	<b>\$4,414,873.62</b>

Land Department expenses and balance applicable to cancellation preferred stock and bonds	703,177.94
Preferred stock and bonds canceled	808,267.75
Construction	14,488,657.40
New equipment	2,138,956.26
Improvements and betterments	1,185,944.70
Material not yet in track	3,489,114.48
Advance for Minneapolis depot grounds	265,322.40
<b>Total</b>	<b>\$27,504,309.55</b>

Balance and accounts receivable	\$9,039,923.49
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From the report of Col. Chas. B. Lamborn, Land Commissioner, it appears that the total sales of lands and town lots by the company during the year were as follows:

Eastern District:	
Acres sold, 287,455.70, for	\$1,035,692.19
Town lots sold, for	173,231.25
<b>Total</b>	<b>\$1,208,923.44</b>
Montana District:	
Acres sold, 239.01, for	621.43
Pacific District:	
Acres sold, 177,513.95, for	\$474,730.20
Town lots sold, for	25,062.98
<b>Total</b>	<b>\$499,793.18</b>

Total sales, 465,208.72 acres and town lots, for	\$1,709,338.05
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There was a decrease in the sales in the Eastern District, but a large increase in the number of purchasers. The actual settlement on the company's lands was greater than in any previous year.

A Bureau of Immigration and Information has been established, and advertising and other means employed to draw attention and attract settlers to the company's lands.

The Transcontinental Survey has been organized under the direction of Prof. R. Pumpelly, for the purpose of making a thorough examination of the company's lands and region tributary to its lines, and ascertaining the mineral resources of the country and its capabilities of production, whether as an agricultural region, as grazing country, or for timber.

The net earnings of the express business, conducted by the company, increased very nearly 100 per cent.

The telegraph lines now include 1,512 miles of wire. These lines are built and operated for this company by the Western Union Telegraph Company.

A contract has been made with Pullman's Palace Car Company, under which the sleeping and hotel cars run over the line will be the joint property of the two companies. The Pullman Company has taken the cars owned by this company, paying half their value, and will put on new cars as fast as needed.

Coal of good quality has been discovered near Bozeman, Montana, and some 80 miles from Billings, which will solve the question of the fuel supply of the line.

The report goes at much length into the question of the claims of the preferred stock and the reasons for the scrip dividend of 11.1 per cent. recently declared to represent surplus earnings used in construction.

#### FINANCES.

The report of President Villard says: "The operations of the treasury of the company during the fiscal year are fully set forth in the general balance and the income and revenue accounts, showing receipts and disbursements, appended to this report."

"The cash on hand at the commencement of the fiscal year was \$11,567,944.33, and the receipts from sales of bonds and preferred stock amounted to \$4,682,086.65; the expenditures of construction funds during the same period aggregated \$21,577,995.24, an amount largely in excess of the resources of the company."

"The additional finished mileage of 275 miles, just inspected and approved by the United States government commissioners, insures an immediate reimbursement to the treasury of a large amount on construction account. But even this will still leave the requirements largely in excess of resources, which excess will again steadily increase until the next issue of bonds. Hence it appears that even if more prompt inspection had been practicable—which it was not—the supply of money from the sale of bonds under the terms of the contract with the Syndicate would not have avoided the necessity for large additional funds as working capital."

"The cause of this necessity is very clear. When the contract with the Syndicate was entered into, it was practically impossible, owing to the incompleteness of the labors of the engineers, to make accurate calculations as to the period of time and the current supplies of money required for the vast work of building nearly one thousand miles of new, and in great part, very difficult road, mostly through unsettled regions destitute of construction facilities. Financial arrangements were made in the light of the best information then extant, which, however, proved deceptive. It soon be-



came apparent that, in order to work without great waste of time and loss of money, it was indispensable, in the first place, to build simultaneously from both ends of the main line, and, secondly, to begin at once all the heavy work upon its entire length. This involved the shipment of millions of dollars' worth of track material, motive power and rolling stock to the Pacific coast many months before their actual use on the road; and on the line east of the Rocky Mountains very large expenditures of cash a long time before the works resulting from them could become parts of finished road.

"Thus there came calls upon the treasury far in excess of the proceeds of bonds received from the Syndicate, and of net earnings; and what added to the embarrassment of the situation was the impossibility of issuing bonds and delivering them to the Syndicate, except upon the mileage of completed road approved by the government, owing to a provision of the mortgage under the requirements of the plan of reorganization. But, thanks to the assistance of the Syndicate and the Oregon & Transcontinental Company, the treasury was always prepared to meet all demands without ever borrowing in the open market. And the management can now point to the fact that it has finished 275 miles of road, graded 150 additional, bought and paid for sufficient rails for the entire gap between the two ends of the main line, and made, besides, the current disbursements for motive power, rolling stock, the Bismarck bridge, the great Bozeman and Helena tunnels, and other heavier portions of the work, without delivering a single bond to the Syndicate from December last till Sept. 19.

"The necessity of employing a large capital in construction in advance of receipts from the successive deliveries of bonds will continue during the greater part of the current fiscal year. But construction has already progressed so far that the culminating point, as regards the required working capital, has been reached, and passed. Moreover, whatever the demands upon the treasury may be in this connection, I am in a position to say that arrangements are perfected to meet each and every one of them. I feel justified even in going so far as to say that the uninterrupted progress of construction till the completion of the main line is assured beyond all contingency.

"The Syndicate promptly exercised the option expiring on July 1, 1882, to take \$5,000,000 of general first-mortgage bonds, in addition to the \$20,000,000 previously called. But the company not being then prepared to deliver them, owing to non-inspection of finished road, the option was extended in accordance with the contract until the date above mentioned, when, in virtue of the inspection and acceptance by the Government of two hundred additional miles of road, \$5,000,000 of these bonds were delivered to the Syndicate.

The General first mortgage bonds have quickly become a favorite security with, and are firmly held by, conservative investors at home and abroad.

#### THE OREGON & TRANSCONTINENTAL CO.

"You are fully informed of the objects of this company by the circular of May 31st, 1882. The record of the past year furnishes abundant proof that the creation of this powerful auxiliary corporation not only met an urgent and immediate want of our company, but was brought about just in time to prevent serious embarrassments from various sources. It is not too much to say, indeed, that the organization of the Oregon & Transcontinental Company gives absolute assurance, both of the completion of the Northern Pacific at the earliest practicable moment as a transcontinental line, and of its certain and unexampled success as such.

In the first place, the Oregon & Transcontinental Company, as the largest stockholder in the Northern Pacific, has extended, and will always be ready to extend, to the latter the direct and strong support of its capital of \$30,000,000. The great value of this support may be measured by the fact that our company was able to push construction steadily throughout the year, without having to halt for a moment, and fully to maintain its credit, notwithstanding the disturbances of the financial markets and the proceedings in Congress mentioned elsewhere in these pages. Next, the assurance of the unexampled success of the Northern Pacific as a finished line lies in the control, through the Oregon & Transcontinental Company, of the vast traffic of the comprehensive system of railroad, ocean and river lines already developed in Oregon and Washington Territory. The importance of this control will be understood from the extent of this tributary system. It covers twelve hundred miles of railroad, draining all the settled portions of the valleys of the Columbia east of the Cascade Range, and of its principal tributaries, the Willamette and Snake rivers, and including a rail connection with San Francisco. It embraces, further, the navigation of those three rivers, as well as of Puget Sound, carried on by 30 steamboats, and, likewise, the whole of the coastwise trade along the North Pacific coast, from the northern boundary of Mexico to Alaska, carried on by 26 ocean steamers. It is estimated that the traffic which will flow from these several sources into the main artery of the Northern Pacific upon its completion will add at once fully \$6,000,000 gross to its earnings.

"Again another inestimable advantage assuring to the Northern Pacific an unlimited development of local traffic: The protection of its general traffic from competition, and a great enhancement in the value of its land grant, lies in the construction, by the Oregon & Transcontinental Company, of a well-ordered system of branch lines whenever and wherever wanted, in Minnesota, Dakota, Montana, Oregon, Idaho or Washington. It is well known that the growth of all the great western railroad corporations is in the largest measure due to the gradual construction of systems of tributary lines. But all these companies succeeded in providing themselves with such local systems only through the efforts, sacrifices and embarrassments of years. The Northern Pacific is, and will probably remain, the only company so fortunate as to command that source of prosperity to the fullest extent, and practically without financial burdens, in the early stages of its career."

#### CONSTRUCTION.

Under this head the report says: "Satisfactory progress has been made during the year in the work of construction of the road, assuring the completion of the entire line during the working season of 1883.

"The construction of a portion of the Wisconsin Division, extending 25 miles eastward from Thomson Junction, Minn., was practically completed during the year. At Superior, 23.4 miles east of the junction, the road reaches the Bay of Superior, one of the best harbors on the inland waters of the United States. A dock is under construction here about 1,000 ft. long by 166 wide, which will enable the company to use Superior Harbor and relieve the overcrowded condition of the docks at Duluth. By pushing tracklaying to Superior prior to Dec. 1, 1881, the company obtained valuable donations of town and county property. Other donations contingent on extending by the same date a spur track to Conner's Point, four miles from Superior, were also secured.

"The construction of this division was continued eastward from Superior across the Nemadji River, in order to complete 25 miles of main track, the shortest section examined

by government commissioners, and was further extended one-half mile to a proposed junction with the Lak. Superior Company of the Chicago, St. Paul, Minneapolis & Omaha Railroad.

"A final location for the extension of the road to a point 100 miles east of Superior, 10 miles west of the Montreal River, the boundary between Wisconsin and Michigan, has been made. The maximum gradient on the Wisconsin Division is 52.8 ft. per mile. The country traversed is densely wooded and in part swampy.

"The construction of the Bismarck bridge was actively prosecuted during the year. Pier 1 was completed Nov. 20; pier 2, Jan. 19; pier 3, June 3; and pier 4, May 12. Progress on the superstructure has been considerably delayed by the failure of the contractor to furnish the steel within the time agreed. Another firm has completed the manufacture, and it has all been delivered. The approach span on the east side was erected in April, and that on the west side in May. The raising of the first long span was successfully accomplished Aug. 12, and the second or central span on Sept. 9, 1882. There is every reason to believe the bridge will be completed before the close of this month (September). The total length of the iron superstructure is 1,400 ft.; that of the trestle approach 1,500 ft.

"Tracklaying began on the Yellowstone Division July 5, 1881, and on June 30, 1882 had been completed 179½ miles. It reached the Big Horn River June 3, where it was delayed by the annual freshet, which came on before the bridge was completed, and for a time put a stop to the work. It was not until July 21 that a train was got across the river on a partly temporary structure. On Aug. 5 the permanent bridge was completed. A transfer boat was taken to the site of the bridge and used to transport cars loaded with track material. June 30 the track had been laid 12½ miles beyond the river, or 179½ miles from Glendive.

"Grading has progressed well along the Yellowstone Division and is expected to be finished by the beginning of October, so that the track can reach the end of the division, 340 miles from Glendive, in November.

"Considerable difficulty has been experienced in the prosecution of the work on this division by reason of the peculiar and variable character of the bluffs along the Yellowstone. Exposure to the air and weather frequently causes the rock to crumble. Sometimes the lower strata will disintegrate, bringing down the hard upper strata in great masses upon the track. The action of the river in seasons of freshet upon the face of the bluffs is often destructive, the water undermining the rock and causing it to cave. At several points it has been necessary to protect the road cut along the face of the bluffs, by dykes thrown out into the river to divert the current from the bank. The most extensive work of this kind is at Iron Bluff, 10 miles above Glendive. Here a vast mass of crumbling material, almost wholly without cohesion, containing several million cubic yards, was slowly sliding toward the river-bed. The first track laid along it was wrecked in a short time. A temporary track then laid has proven permanent. By a strong dyke the main channel of the river has been diverted from the foot of the sliding bluff to the opposite shore. Between Fort Keogh and Custer, 91 miles, there are 23 miles of bluff work. The line follows the south side of the Yellowstone for 223 miles to nearly opposite Billings. There the Yellowstone is crossed; 54 miles above, it will again be crossed, and near the western end of the division it is to be crossed a third and last time.

"The maximum grade of this division is 26.4 feet per mile, and the total rise from Glendive to Livingston, 340 miles, is 2,410 feet.

"The Rocky Mountain Division commences at the point where the road leaves the Yellowstone Valley, crosses the Belt Mountains by a tunnel at the summit of Bozeman Pass, 3,600 ft. long; follows the valleys of the East Gallatin, the Missouri and the Prickly Pear to Helena; crosses the main range of the Rocky Mountains by a tunnel at Mullan Pass, 3,850 ft. long, and ends at the Little Blackfoot River, on the western slope of the mountains. It is 151½ miles long. The highest elevations attained by the road are at the summit grade at Bozeman Tunnel, 5,565 ft., and at the Mullan Tunnel, 5,548 above the level of the sea. The maximum grade of this division is 52.8 ft. per mile, except in crossing the mountain ranges, where a maximum of 116 ft. is employed.

"Grading was commenced at Bedford, nearing the crossing of the Upper Missouri River, in August, 1881, and continued 32 miles to Helena.

"Work was begun at the Mullan Tunnel in the middle of November, 1881. Power drills worked by compressed air were employed in January, and on June 30 they had penetrated 754 ft. The progress has since been more rapid. A shaft 3,150 ft. west of the eastern portal has been sunk, from which excavation is carried on both ways. The western approach to the tunnel is a mass of wet earth fill with springs, which had not, July 31, been excavated sufficiently to open the western portal.

"Work on the Bozeman Tunnel was begun in March, 1882. Both approaches are of earth filled with springs, and slow progress has been made. The approaches were so far advanced that work in the main tunnel was begun at the western end in August and at the eastern end in the present month. A line has been laid out over the summit of the pass, with grades of 212 ft. to the mile, which will be graded and the track put down by the time the road is completed to the tunnel. This temporary road will be used until the tunnel is opened. Specially heavy locomotives have been ordered and will be in readiness for service when needed.

The Missoula Division extends from the end of the Rocky Mountain Division to the head of Clark's Fork of the Columbia, 163.8 miles, following the Little Blackfoot and Hell Gate Rivers to Missoula, crossing the Coriarian Defile to the valley of the Jocko River, and descending that stream to the Flathead River, and the Flathead to where its junction with the Missoula forms Clark's Fork. The total descent is 2,560 feet. The maximum grades are 52.8 ft. per mile, except at the crossing of a mountain spur at Coriarian Defile, where the grade is 116. The highest structure in the road occurs in this defile, the Marent Gulch trestle, 750 ft. long and 222 high. Hell Gate River is crossed 10 times. Truss bridges will be built of the timber of the country.

"The western end of the Missoula Division for 53 miles passes through the Flathead Indian Reservation. Consent for the company to build this portion of its line has just been obtained from the Indians.

"The Clark's Fork Division extends from the head of Clark's Fork to the junction with the Pend d'Oreille Division at Sand Point, a length of 128 miles. Construction work is carried on from the western end principally by forces employed by the railroad company under its own Superintendent. These forces amount to nearly 6,000 men, about 4,000 of whom are Chinese. During the year the track advanced eastward 102 miles to Cabinet Landing, on Clark's Fork, 263 miles from Wallula. On June 30 the end of track was 33 miles east of Sand Point, and the end of completed grade 41 miles, with nine miles in progress. The difficulties in the way of constructing the road up Clark's Fork are extreme, the valley being a mountain gorge densely timbered, broken, rocky and precipitous. No road exists save a pony trail on the opposite bank from the rail-

way line, and numerous rapids interfere with the navigation of the river. To aid the construction work the company has placed a small steamer on a comparatively smooth stretch of the river 40 miles long, beginning 21 miles above Cabinet Landing, and has also built a wagon road from near the mouth of the Jocko to Thompson's River, 50 miles. About 25 miles of difficult work still remain in front of the force on Clark's Fork, after which the character of the country changes and the work will be much easier. It will be late in November before the track can be laid to the east end of Clark's Fork Division.

"The grading and bridging of the Pend d'Oreille Division was completed in the fall of 1881, except the long trestle across the outlet of Lake Pend d'Oreille, which was finished early in the present year. A Howe truss bridge 200 ft. long was built over the Spokane River. Preparations are commenced for a bridge over Snake River at Ainsworth. It will be 1,540 ft. long, with a draw turning on a pivot pier.

"Surveys for a connection between Portland and Kalama have been completed, and a good line with easy grades located on the south bank of the Columbia River. The distance is 39½ miles.

"A bridge with two draws will be built across the Willamette, from Portland to East Portland.

"Surveys were continued on the Cascade Division to determine the best route and the best point for crossing the Cascade Range. Twenty-one passes have been examined. The result is that the Stampede Pass, at the head of Sunday Creek, a branch of Green River, is shown to be the best point for crossing. It is nearly due east from Tacoma, and can be crossed by a tunnel 9,100 ft. long, at an elevation of 2,885 ft. above the sea level. The line from Tacoma to Bluff Wells on the main road is 308 miles long by this route. Stampede Pass has decided advantages in its low elevation, comparative ease of access, and entire freedom from slides of snow, rock or earth, in the pass itself or on any part of the line approaching it.

"The work of filling in the marsh at St. Paul for more track room has been continued; 4,122 lineal ft. of new track laid; a double-track iron bridge across Fourth street built; an iron turn-table and a water tank, sand-house, coal platform, temporary engine-house and blacksmith shop erected. The work on the general office building is progressing. June 30 the walls were completed to the fourth story. It is expected that the building will be ready for occupancy on January 1 next.

"The round house and shops begun at Brainerd last year are in part completed. A brick shop for locomotive and car repair is under construction at Glendive; also a round house at Forsyth. Preparations are being made for the erection of shops and a round house at Billings.

"A company known as the Terminal Company will be organized, in the formation and management of which the Northern Pacific will participate, to build a union passenger and freight depot at Portland, and provide other terminal facilities for all the roads centering at that point. Grounds for the Union depot have been purchased in North Portland, immediately adjoining the business portion of the city. The plan contemplates a passenger depot covering 18 acres fronting upon the city park, and an adjoining freight depot covering 30 acres, with an available length for tracks of 2,200 ft., and an equal length of excellent river front. The Northern Pacific trains from the East will cross the Willamette River on a bridge with double track, and thence enter the Union depot. The trains from Puget Sound will run directly into the depot. Equally good facilities are provided for the entrance of the Oregon Railway & Navigation Company's trains and those on the east and west side roads of the Oregon & California Company. In fact, the location and plans fully cover all present and future needs in the way of railway terminal facilities and connections at Portland.

"On the east side of the river purchases have been made of about 246 acres for the machine shops of the several roads. On the river front of this tract will be erected coal bunkers, a warehouse and a wheat elevator. A dry dock is now in course of construction there, and a large wharf for the accommodation of ocean steam and sail vessels of deep draught is being built, with which the tracks of the several companies will have connection."

The following account is given of the new branch lines: "Little Falls & Dakota.—The grading to Morris, 87 miles, is completed, and the track laid 55 miles. Tracklaying will be completed to Morris by the first of October.

"Northern Pacific, Fergus & Black Hills.—June 30, track was laid from Wadena Junction to Fergus Falls, 50 miles, and is to be completed to Breckenridge, 75 miles, in the present month. It is designed to extend it this season westward into Dakota about 30 miles.

"Fargo & Southwestern.—Grading will be completed to the James River, 80 miles, this season. Track laying began July 1, 1882, and will be continued this season to the James River, if practicable; 20 miles are already laid.

"Jamestown & Northern.—Grading was well advanced June 30 on 35 miles north from Jamestown to the Sutsman County line. Fifteen miles more will be graded this season and the track laid to Sutsman County line. This line will run north to the west end of Devil's Lake.

"Fort Benton Line.—A survey was commenced in May for a branch leaving the main road at Billings, and running northward to Fort Benton, the head of steamboat navigation on the upper Missouri, a distance of 150 to 175 miles. The work had not progressed far enough by the end of the year to form a definite idea of the characteristics of the route. This line can be the outlet for the Sun River, Marais River and Judith valleys, said to be the best grazing country in Montana.

"National Park Line.—Two routes have been surveyed to the National line, one leaving the main line at Livingston, on the Yellowstone, and the other at Bozeman. The first runs up the Yellowstone and Gardner rivers, and the second up the West Gallatin. A report on the route from Bozeman has not yet been received. That on the line from Livingston shows easy grades to the mouth of Grouse River, from which point grades of 212 ft. to the mile are required.

"Palouse Branch.—From Palouse Junction, on Pend d'Oreille Division, about 38 miles northwest of the confluence of the Snake and Columbia Rivers, in Washington Territory, eastward to Farmington and Moscow, in Idaho Territory. The grading is nearly completed from the Junction to Colfax, 37 miles, and the track is expected to reach that place, and possibly Farmington, before the end of the year.

"The company has now on hand and paid for the following material for the completion of the road: for the Eastern Division 15,000 tons of steel rails and fastenings; for the Western Division 23,000 tons; total, 38,000 tons. In addition 12,000 tons of steel rails are to be delivered prior to Oct. 31.

"At the beginning of the year, July 1, 1881, the ends of track on the main line were 857 miles apart. They were advanced during the year from the east, 183 miles; from the west, 102 miles, a total of 285 miles, leaving, June 30, 1882, 572 miles to be built. This will be lessened by the close of 1882, probably 300 miles, leaving 272 miles of track to be laid after Jan. 1, 1883. The final connection of the tracks is expected to be made during the season of 1883."





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#### EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

#### NEW TRUNK LINES.

There are now in course of construction two new railroads between New York and Buffalo, one between Buffalo and Chicago, and one other from Chicago eastward, which will be a trunk line connection. All these lines are built through country full of railroads, and all but one are almost alongside of existing roads, so that their local stations, most of them, will be at the same towns, or within a very few miles of each other. The New York, Lackawanna & Western, an extension of the Delaware, Lackawanna & Western, which will probably be opened to Buffalo in a few weeks, is scarcely anywhere more than three or four miles from the Erie in the 200 miles between Binghamton and Buffalo; the New York, West Shore & Buffalo is quite as near the New York Central & Hudson River all the way from New York to Buffalo, and nearly the whole of its local traffic must come from places which are now served by the Central; the New York, Chicago & St. Louis, which is to be opened for business Oct. 15, is almost alongside the Lake Shore for the 188 miles from Buffalo to Cleveland, near it for 75 miles further, and all the way across Indiana is within a very few miles of the Fort Wayne, and but little further from the new Chicago & Atlantic road. This latter, which it is expected to open as soon as Dec. 1, is not so near parallel roads as the others.

The situation of these roads and their position in relation to other roads which form lines or parts of lines between New York and Chicago may be seen on the map accompanying this number, which has been purposely made to omit all branch lines and lines not serving as connections between New York and Chicago, to prevent confusion. There are enough of these latter, it will be seen, to form an extensive and somewhat complicated network. The new lines, whose location and probable effect it is especially important to study now, are represented by solid lines, the others by various characters which will readily distinguish them from each other. It should be said that there is omitted the Philadelphia & Erie, over which in connection with the Pennsylvania and the Lake Shore the Empire Line cars run between New York and Chicago; and one line is shown which at present seems superfluous, namely, the line by the Central of New Jersey, the Reading, the Philadelphia & Erie and the Low Grade Division of the Allegheny Valley, between New York and Red Bank, in Western Pennsylvania. A year ago or more ago agreements were made for the establishment of a line by this route, which it was said would be connected by a new road with the Wabash, and form the chief Eastern outlet of the latter road. We cannot learn that any steps have been taken towards completing the missing link west of Red Bank, and nothing is said of this "new trunk line" recently.

The New York, Lackawanna & Western Railroad is to form an extension of the Delaware, Lackawanna & Western; ten of its 13 directors are also directors of the latter company, and they have the same President

Secretary, Treasurer and Superintendent; and it is expected that the old company will lease or absorb the new one. Five of the new company's directors are also directors of the Wabash, Messrs. Gould, Sage, Dillon, Humphreys and Sloan.

The distance from New York to Binghamton by the Delaware, Lackawanna & Western is 210 miles; that from Binghamton to Buffalo by the new road is 204 miles, which makes it 414 miles from New York to Buffalo, against 433 by the Erie. The alignment, we are not now able to report. This will be the shortest line between New York and Buffalo, and a very picturesque one, passing through the Delaware Water Gap and by Scranton. It has the great advantage of the extensive terminal grounds of the old company on New York harbor, and the still greater advantage of the great coal traffic which the Delaware, Lackawanna & Western can command and offer as return cargoes for cars coming from the West laden with grain or live stock, or for vessels bringing it grain to Buffalo. At a moderate cost any road entering Buffalo can command a connecting line of lake steamers which will serve during the season of navigation for carrying merchandise as well as coarser freight; with what railroads west of Buffalo it will connect we cannot say positively. It seems commonly assumed that its chief interchange of traffic will be with the New York, Chicago & St. Louis, but from what we hear it seems more probable that it will make a Chicago line with the Canada Southern and the Michigan Central, by the first of which it can connect with the Wabash. It is not likely to go begging for connections, however. The Grand Trunk has always been anxious for more business to and from New York, and the New York, Chicago & St. Louis will want all it can get.

The New York, Lackawanna & Western has a funded debt of \$12,000,000 (\$60,000 per mile) in 6 per cent. bonds, and its capital stock is \$10,000,000.

The New York, West Shore & Buffalo will be more nearly a duplicate line than any other long one yet built in this country. From New York to Albany the Hudson River will separate it from the New York Central & Hudson River, but no such formidable obstacle is between them from Albany to Buffalo, and now the Central is the chief rail outlet for the west shore as well as the east shore. The two roads will compete at nearly every station of the West Shore road, and the latter will have an opportunity to share the enormous passenger traffic of the Central. There is scarcely any other such mine of traffic in this country; but the value is not in proportion to the amount. Between New York and Albany the magnificent Hudson affords the cheapest of all transportation, and attracts a large share of the travel as well as the freight. Between Albany and Buffalo the canal keeps down local as well as through freight rates. An enormous traffic is absolutely necessary to support a road on this route, and the West Shore will need a good deal of support, as \$50,000,000 of 5 per cent. bonds are to be issued on the 425 miles of road, or at the rate of \$117,650 per mile (against \$43,500 on the New York Central). It is true that the New York Central profits would cover the interest charge several times over; but with four roads instead of two between New York and Buffalo, the new ones will certainly not for a long time get as much as the old ones have had, though they will doubtless reduce somewhat, and probably considerably, the traffic of the old roads, the more so as they will take from their local as well as their through traffic. The stock of the West Shore road is \$40,000,000, and the stock and debt will be about \$211,765 per mile, against \$175,560 on the New York Central, and \$806,950 on the Erie.

This company's road will not be opened through to Buffalo for more than a year, probably. It is without doubt constructing a better railroad than any other in America was when first built, and apparently no pains or expense is spared to make it as perfect as possible in road and equipment and staff (the latter not the least important) to secure safe and economical working, so that it may be superior rather than inferior to the best of the old roads when finally it is opened for traffic. One-third of the road will be level, and the prevailing maximum grades will be 20 ft. per mile going east and 30 ft. going west, slightly exceeded for short distances. A double track of 67 lbs. steel rails is laid, with rock ballast, masonry bridges and iron culverts. The work along the Hudson River is very heavy, there being much rock cutting and two important tunnels.

Most of this work is now completed, but though more than 20,000 men are at work on the line between New York and Syracuse, it is not expected to open the line between New York and Albany until some time next winter. West of Syracuse the contracts are not yet let.

It is said that all the capital necessary has been secured for completing this road. The bonds are quoted at about 63, at which price they would yield about \$74,000 a mile. But even if formidable temporary obstacles should be met, so much very expensive work has been done on the road that it is almost absolutely certain that it will be completed by some one, in order to get some return from the capital invested. And when completed it must have a great effect on the New York Central Railroad, competing as it will at almost every station on the main line for passengers as well as freight. It will be prepared to do a heavy business, and will be sure to make rates that will secure it; and it cannot be fought as competing trunk lines sometimes are, drawing supplies from local traffic while the war goes on. A contest with it will necessitate the sacrifice of profits on nearly all traffic. Thus whatever the West Shore road may do for itself, it seems sure to be more formidable to the New York Central than any rival it has yet had to meet.

In order to estimate the effect of these new trunk lines on the older ones and their own prospects, we need to follow the course of business on the lines with which they compete—to see what has been the total traffic which hereafter they will share. In the case of roads like these, close to existing lines, the field of traffic—the common pool from which all will draw—is nearly the same. The new lines do not develop any new districts of any importance that have not heretofore been served by the old ones. The same towns and cities and industries will be served by both parallel lines. Manifestly, there must be an increase of the total net earnings from the traffic if the old roads are to be supported as well as heretofore, and the new ones get any support at all. The traffic—that is, the freight traffic—grows all the time, and quite rapidly; the passenger traffic growing only in prosperous times. The question is, how fast does it grow, and especially how fast do earnings, and, most of all, net earnings, grow. Let us see.

Below we give a statement of the passenger traffic for the last ten years of the three trunk lines that report it, in millions of passenger miles; that is, the figures 357.9 for the passenger traffic of the Pennsylvania Railroad in 1872 mean 357,900,000 passenger miles, etc. Under Pennsylvania are included all its lines east of Pittsburgh and Erie. Its reports are for the calendar year, and those of the two New York companies for the twelve months ending Sept. 30 of the years named. This difference in the year is of considerable importance, as, for instance, 1881 for the Pennsylvania Railroad includes six months of railroad war and three months of light east-bound traffic, while 1881 for the other two roads includes only three months of railroad war and no months of light traffic. These explanations apply to all the other tables for trunk line business;

Trunk Line Passenger Mileage for Ten Years.

Year.	Penna.	N. Y. Cen.	Erie.	The three.
1872.....	357.9	342.3	156.1	856.3
1873.....	362.2	364.4	164.6	891.2
1874.....	355.6	350.8	160.2	866.6
1875.....	344.2	338.9	155.4	838.5
1876.....	62.2	253.1	163.1	1,138.4
1877.....	298.8	316.6	170.9	786.5
1878.....	292.7	30.3	140.3	733.3
1879.....	314.3	291.0	149.1	754.4
1880.....	3.2	330.8	180.5	864.1
1881.....	446.3	373.8	200.5	1,020.6

This illustrates our statement that passenger traffic grows only in prosperous times. On every one of these roads the passenger traffic was less in 1879 than in 1872, and, except in the centennial year, less every year until 1880 than in 1873. The last two years show a considerable growth, doubtless continued this year, and largely due to immigration.

Now, if the whole increase in passenger traffic from 1872 to 1881 had been secured by two new roads between New York and Buffalo, they would have had last year 82 millions of passenger miles each—about two-fifths of what the Erie had last year. Doubtless they would have got more, but they would have got it by decreasing the passenger traffic of the older lines.

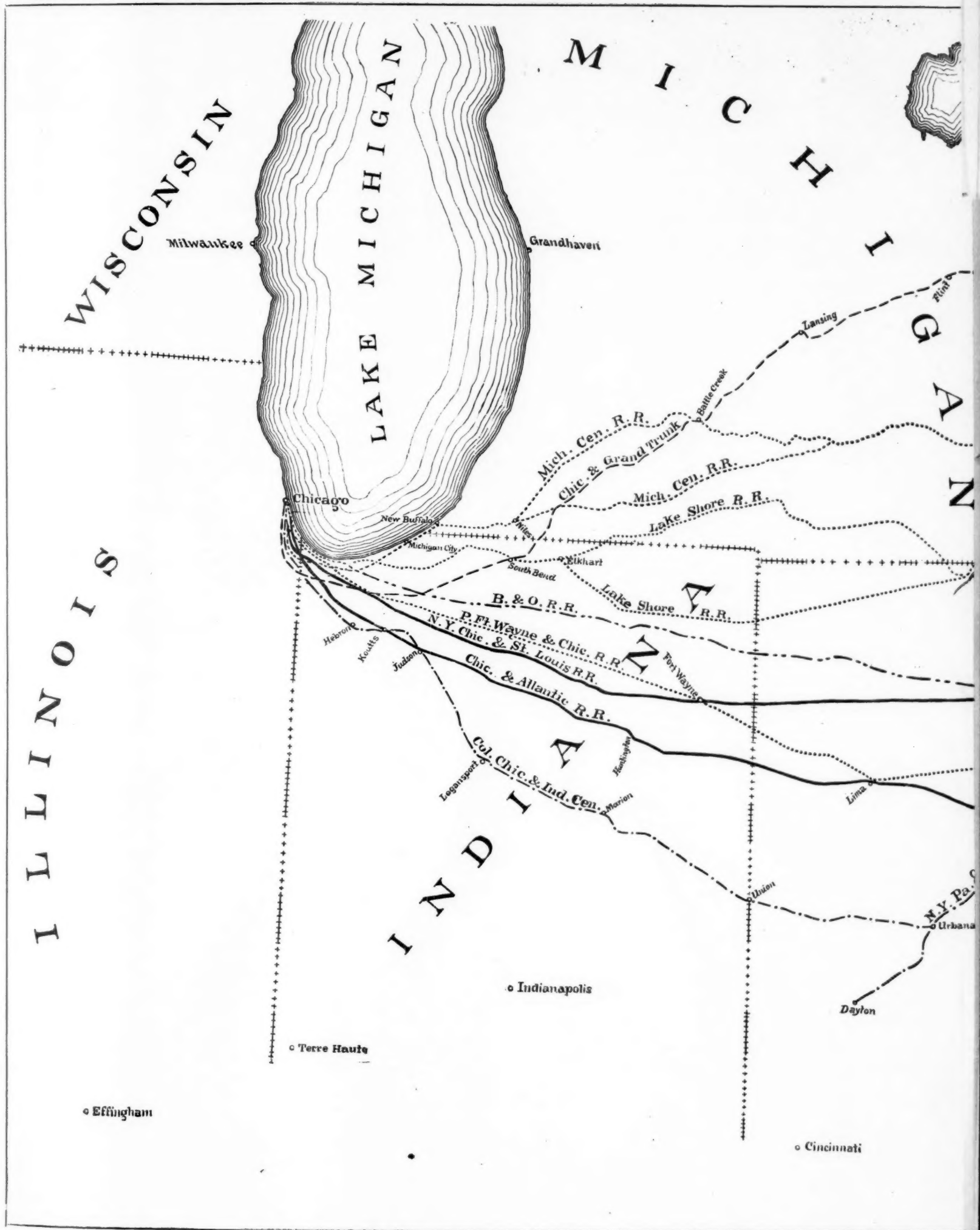
Earnings, however, may fluctuate very differently from traffic. As a fact, however, average passenger rates in this country have not fluctuated greatly, the exceptions in the last two or three years being due chiefly to the great increase of immigrants carried at low rates. The passenger earnings of these three lines for the ten years have been as follows:

Trunk Line Passenger Earnings for Ten Years.

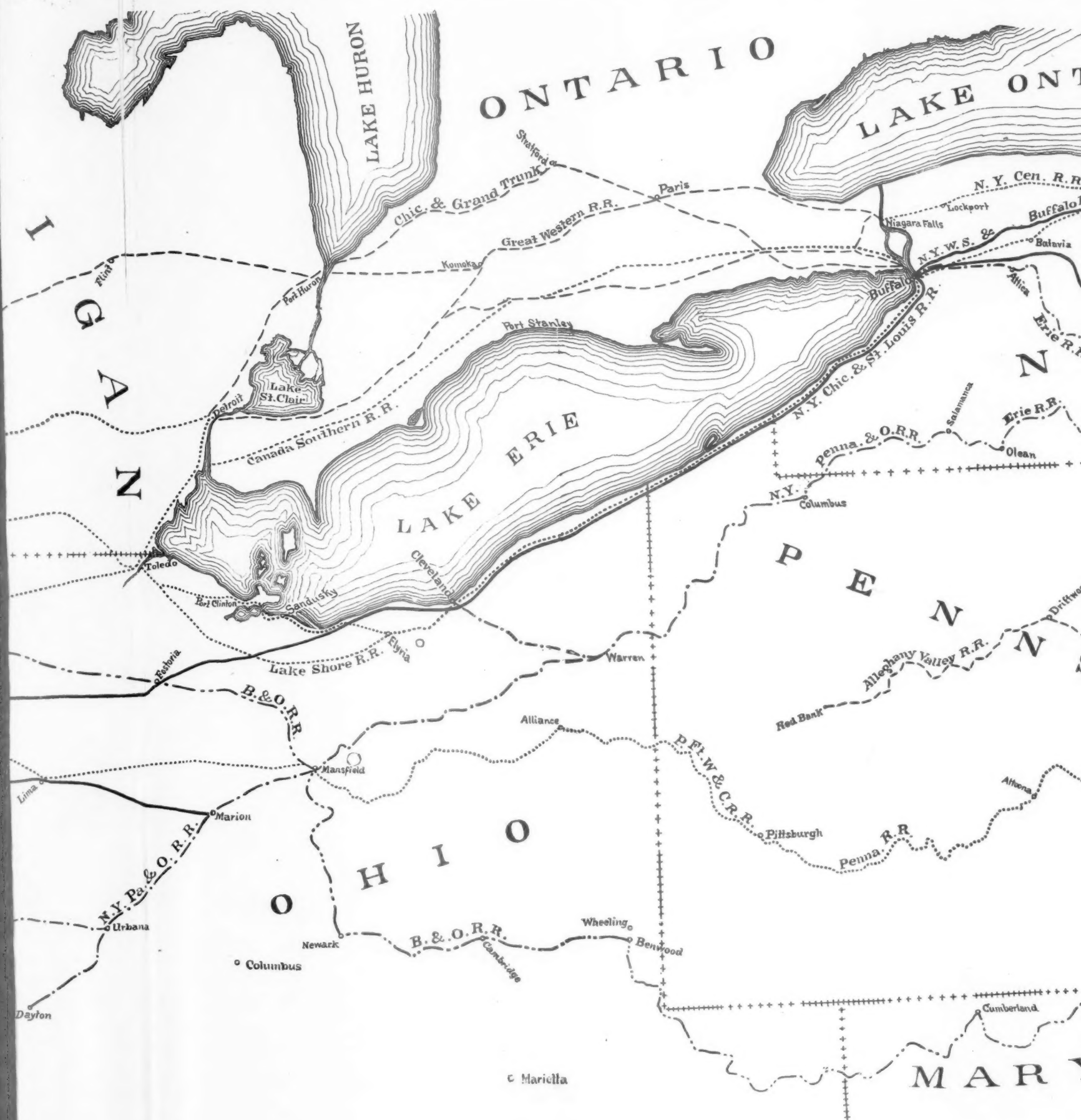
Year.	Penna.	N. Y. Cen.	Erie.	The three.
1872.....	\$8,482,604	\$7,772,203	\$3,529,347	\$19,784,154
1873.....	9,692,413	8,147,692	3,361,554	21,201,659
1874.....	8,239,076	7,487,357	3,705,574	19,432,007
1875.....	8,857,930	7,276,848	3,461,304	19,595,772
1876.....	13,337,539	6,762,967	3,427,626	25,528,132
1877.....	7,440,229	6,576,816	8,200,090	17,237,135
1878.....	7,239,747	6,322,956	3,070,121	16,632,824
1879.....	7,701,017	5,953,102	3,118,944	16,773,063
1880.....	9,030,416	6,611,159	3,682,551	19,324,526
1881.....	10,167,109	6,958,038	4,041,267	21,166,414

The largest aggregate passenger earnings of these three roads were in 1876; but in 1873 they were larger than in any other year except 1876, a trifle larger than









## THE NEW TRUNK LINES

AND THE RAILROAD LINES BETWEEN NEW YORK AND CHICAGO WITH WHICH THEY WILL COMPETE

(Only the New Roads are Represented by Unbroken Lines.)









last year, even, when the passenger traffic was 14½ per cent. larger than in 1873. The average rate per mile was 2.40 cents in 1872, 2.03 cents in 1876 (with a trunk line passenger war and reduced Centennial rates), 2.16 in 1880 and 2.04 cents in 1881.

The great resource of American railroads, however, even of the trunk lines, is the freight traffic, which grows enormously in prosperous times and usually pretty fast in dull times. For the three trunk lines we give it below in millions of ton-miles:

Trunk Line Tonnage Mileage for Ten Years.

Year.	Penna.	N. Y. Cen.	Erie.	The three.
1872.....	1,579.9	1,042.0	965.9	3,578.8
1873.....	1,802.9	1,277.5	1,033.0	4,113.4
1874.....	1,845.3	1,391.6	1,047.4	4,284.3
1875.....	2,026.2	1,404.0	1,013.6	4,443.8
1876.....	2,217.7	1,674.4	1,040.4	4,932.5
1877.....	2,096.7	1,320.0	1,114.6	4,531.3
1878.....	2,308.3	2,042.8	1,234.8	5,585.9
1879.....	2,074.9	2,205.8	1,569.2	5,849.9
1880.....	2,230.5	2,251.1	1,721.1	6,202.7
1881.....	2,631.8	2,646.8	1,984.4	7,263.0

Here we find growth indeed. In only one year (1877) was the traffic less than in the previous year. From 1872 to 1881 there was an increase of 131 per cent. on the Pennsylvania, 154 per cent. on the New York Central, 105 on the Erie, and 131 per cent. in the aggregate. If the total increase of the three lines had been secured by two new lines, it would have given them 2,937 millions of ton-miles each—as much as the New York Central had before 1880. If the increase of the two lines between New York and Buffalo had been secured by two new lines, they would have had 1,331 millions of ton-miles each—nearly as much as the Central in 1874; but if the whole increase had been divided equally among five roads instead of the three, the new ones would have had but 937 millions each.

But freight earnings do not by any means keep pace with freight traffic. Indeed the great feature of railroad business in this country since 1873 has been the steady and rapid reduction in average rates. In fact, it has been to sweeping reductions in rates that the enormous growth of railroad traffic has been due. We will, therefore, need to compare the freight traffic closely with the freight earnings before we conclude that the harvest is promising. These earnings for ten years we give below:

Trunk Line Freight Earnings for Ten Years.

Year.	Penna.	N. Y. Cen.	Erie.	The three.
1872.....	\$23,321,037	\$17,553,538	\$14,509,745	\$55,384,320
1873.....	26,000,363	20,947,168	15,015,878	61,963,409
1874.....	24,715,418	20,487,255	13,700,012	58,902,685
1875.....	21,807,609	17,809,701	12,287,400	51,904,710
1876.....	21,132,500	17,333,265	11,429,970	49,895,735
1877.....	21,149,389	16,424,317	10,617,807	48,291,513
1878.....	21,961,448	19,045,830	11,914,490	52,921,768
1879.....	24,085,975	18,270,250	12,233,481	54,589,706
1880.....	30,258,473	22,199,960	14,291,115	66,749,548
1881.....	32,572,448	20,736,750	15,979,576	69,288,774

Thus though the freight traffic increased largely (17 per cent.) from 1873 to 1877, the freight earnings meanwhile decreased no less than 23 per cent. In 1879 the traffic was 90 per cent. more than in 1872, but the earnings were nearly the same. With an increase of 131 per cent. in traffic from 1872 to 1881, the increase in earnings is but 25 per cent. The average rate per ton per mile, which was 1.55 cents in 1872, fell to 1.00 cent in 1877, and to 0.81 in 1879. It advanced to 0.89 cent in 1880, but last year fell back to 0.84 cent. The whole increase of gross earnings in the ten years divided between two new roads would have given each a little less than \$7,000,000. What more they obtained would have been at the expense of the old roads.

Even gross earnings, however, are not a safe criterion of the support given to the roads. Expenses do not always vary in proportion to them. Fortunately expenses have not kept pace with traffic; if they had there would be no profits now. But they decreased from 1873 to 1877, and since 1877 have increased largely, and were larger last year than ever before. The course of profits from traffic we shall see by examining the following table of net earnings for ten years:

Trunk Line Net Earnings for Ten Years.

Year.	Penna.	N. Y. Cen.	Erie.	The three.
1872.....	\$11,678,173	\$10,271,381	\$3,913,021	\$25,862,575
1873.....	12,170,403	12,925,074	6,371,994	31,467,471
1874.....	13,380,575	13,202,089	5,051,161	31,633,725
1875.....	12,843,018	11,765,110	4,197,229	28,805,357
1876.....	14,450,586	11,922,416	3,621,259	29,994,261
1877.....	11,609,716	11,632,924	3,809,050	27,111,690
1878.....	12,738,607	13,774,578	5,009,114	31,522,300
1879.....	13,868,505	12,735,511	4,767,324	31,371,340
1880.....	16,546,938	15,323,019	7,049,183	38,919,140
1881.....	17,414,373	12,883,610	7,459,375	37,757,358

The fluctuations in net earnings since 1873 have not been so great as those in gross earnings. From 1873 to 1877 the latter fell off 24 per cent., the net earnings only 14½ per cent. From 1878 to 1881 gross earnings increased 32 per cent., net earnings 23½ per cent. And from 1872 to 1881, with an increase of 131 per cent. in freight traffic and 19 per cent. in passenger traffic, there was an increase of 46 per cent. in net earnings. The increase in the ten years divided between two roads would have given them a little less than \$6,000,000 each; but if we date from 1873 instead of 1872, the gain would give them but \$3,150,000 each.

Now this does not prove that the new roads will not

be supported, or even that they will not be very profitable; but is pretty conclusive evidence that if they are it will be largely at the expense of other roads, chiefly of the trunk lines, and most of all those trunk lines beside which they run and whose local traffic they will share.

As the trunk lines carry the traffic brought from Chicago by the Western roads, the course of business on the latter is quite similar. The country on their lines grows faster, perhaps, but more new railroads are built near them. They are, however, comparatively cheap, and will not require very large profits to support them.

The first of the Western roads to be opened, the New York, Chicago & St. Louis, is a line 521 miles long between Buffalo and Chicago, which is 8 miles shorter than the shortest of the Lake Shore's lines, and of about the same length as the Grand Trunk and the Canada Southern-Michigan Central routes. The maximum grade going east between Chicago and Dunkirk is 20 ft. per mile; but between Dunkirk and Buffalo the grades are heavier. In the other direction the maximum grade is 30 ft. About 60 per cent. of the line is level, and 92 per cent. is straight. The maximum curvature is three degrees. It is built high with much embankment, many bridges (about 10,000 ft. in all) and few cuttings. The single track is laid with 60 lbs. rails, except on part of the western division where 56 lbs. rails are used. With its alignment and the road-bed thoroughly maintained, it will be able to haul very large trains. This road has issued \$15,000,000 of first mortgage 6 per cent. bonds, and \$4,000,000 of 7 per cent. equipment bonds. This on the 512 miles of road owned by the company (it uses nine miles of the Illinois Central in entering Chicago) gives a debt of \$37,100 and a yearly interest charge of \$2,305 per mile. Arrangements have been made to run passenger trains in connection with the Erie, making a line 944 miles long between New York and Chicago; and a freight line, to be known as the "Traders' Line," will also be established by it and the Erie. It has close relations with the Lake Erie & Western, from Sandusky to Bloomington, Ill., which, with the Chicago & Alton, will give it a St. Louis connection. It will compete with the Lake Shore at some important traffic points, by far the most important of which is Cleveland; but the western half of the road is nearer to other roads than to the Lake Shore, and in Indiana both the Fort Wayne and the Baltimore & Ohio are between it and the Lake Shore. To compete with the Lake Shore it must accept low rates and afford good accommodations. At Chicago it will be able to compete for traffic like the other roads to the East.

The Chicago & Atlantic, extending from the New York, Pennsylvania & Ohio at Marion, O., to Chicago, or rather to the Illinois line at Hammond, Ind., whence 16 miles of the Chicago & Western Indiana affords it an entrance into Chicago, is 249 miles long. It was built especially to make a line between New York and Chicago for the Erie and the New York, Pennsylvania & Ohio, and a traffic agreement between the three roads was agreed upon before the new road was begun. It was at one time supposed that this would be made the sole Chicago connection of the Erie, and that the latter company had guaranteed its bonds. The agreement, however, was not exclusive. The Erie agrees to give the Chicago & Atlantic west-bound traffic in proportion to the east-bound traffic delivered to it by the Chicago & Atlantic, and if the latter does not earn the interest on its bonds, the Erie will contribute toward paying it the gross earnings from the traffic thus interchanged. The Erie's gross earnings from Chicago traffic were probably one year as much as \$1,500,000, besides those from live stock and passengers; but it then had freight lines over three other of the five roads into Chicago, as it now has over three of the six, and it will have one over the New York, Chicago & St. Louis, as well as the Chicago & Atlantic; so the amount of its guarantee will be by no means equal to its earnings in Chicago traffic. It will, however, be as large as the Chicago & Atlantic can succeed in making them. There is no expectation, however, that it will be called on to pay anything on account of its guarantee. The Chicago & Atlantic has a funded debt of \$6,500,000 bearing 6 per cent. interest; this covers equipment costing \$1,000,000. What more is required is to be secured through a car trust. A second mortgage for perhaps a million will probably be issued soon to provide working capital. Of the 249 miles between Marion and Hammond 96 per cent. is tangent, and the sharpest curvature is 3 degrees, of which there is one-sixth of 1 per cent. The maximum grade in either direction is 26 ft. per mile, and of this the longest is 3½ miles; 30½ per cent. is level and an equal amount with a grade not more than 10 ft. per mile; 23

per cent. has the maximum grade. The road is an embankment road, well out of the low grounds where the water not infrequently covers the track on existing roads in Indiana. The country is generally quite level and free from rock on the line, though there has been some quite heavy work on it. There are no large towns on the road; the terminal stations in Chicago will be supplied by the Chicago & Western Indiana for a yearly rental. The local traffic on the line cannot be very heavy, but it has more country between it and the parallel lines than the other new roads. It is to be opened about Dec. 1.

We have not compiled the statistics of the business of the Chicago roads so completely, or for so long, as for the Eastern trunk lines; but the following statement of the aggregate freight traffic (in millions of ton-miles), for the Michigan Central, the Lake Shore the Fort Wayne, and the Columbus, Chicago & Indiana Central, and of the aggregate net earnings of these roads and the Chicago Division of the Baltimore & Ohio for the last seven years, will throw some light on the subject:

Year.	Millions of ton-miles.	Net earnings.
1875.....	2,770.3	\$10,100,133
1876.....	2,446.9	10,401,773
1877.....	2,071.1	9,860,607
1878.....	2,855.0	12,844,703
1879.....	3,613.3	14,401,417
1880.....	3,824.4	18,480,679
1881.....	4,398.3	15,636,773

We have a gain since 1875 of 112½ per cent. in freight traffic, and 49 per cent. in net earnings. Last year in comparison with 1880 makes a worse showing for these roads than for the Eastern lines, because the reports of these roads are all for the calendar year. The traffic, however, was unduly swelled by the railroad war.

We have had recent experience of the opening of a new line from Chicago eastward, which we have not had of a new line from New York westward. It is now eight years since the Chicago Division of the Baltimore & Ohio was opened. This line is in many respects like the Chicago & Atlantic, and of almost the same length. Its traffic, however, is greatly limited by the fact that it does not carry (to any extent) to seaports other than Baltimore, while the two new roads will be able to take consignments to Philadelphia, New York and New England, doubtless.

The gross and net earnings of the Chicago Division of the Baltimore & Ohio (263 miles) since it was opened have been:

Year.	Gross earnings.	Net earnings.
1874-75.....	\$950,164	\$210,184
1875-76.....	1,231,746	136,793
1876-77.....	957,691	121,280
1877-78.....	1,057,559	429,343

\*Deficit.

The year after the opening this line the expenses exceeded the earnings at the rate of \$893 per mile; the second the net earnings were \$634. In 1877-78 they were \$1,633 per mile, which would pay 6 per cent. on \$27,200, and they have always been larger since.

The Chicago & Grand Trunk was not opened through in its present shape until the spring of 1880, though some through business was done over it previously. It is 330½ miles long. Its traffic, gross and net earnings have been:

Year.	Passenger-miles.	Freight ton-miles.	Gross earnings.	Net earnings.
1880.....	11,600,502	160,135,051	\$1,383,614	\$221,773
1881.....	28,600,744	228,634,069	1,631,751	190,726

Half a year of railroad war resulted in making an increase of 150 per cent. in passenger, and 43 per cent. in freight traffic in 1881 yield smaller net earnings than in 1880. Its gross earnings last year were \$4.937 per mile, which is not bad for a new road, but the net earnings were then only \$301 per mile. A year of railroad war, however, will not serve to show the ability of the road to earn profits. It is probably earning now enough to pay interest on \$25,000 a mile. The shipments of freight (not including live stock) from Chicago through to points as far east as the western termini of the trunk lines at Buffalo, Pittsburgh, etc., have been

Tons.....	1879.	1880.	1881.
	2,471,738	2,300,640	2,849,317

For the eight months ending with August these have been:

Tons.....	1879.	1880.	1881.	1882.
	1,799,193	1,614,580	1,889,397	1,322,643

If for the remaining four months of the year the shipments shall be as large as in the corresponding months last year (when they were much larger than ever before), the shipments of the year will still be but about 2,322,000 tons, or less than in 1879 or 1881, and about the same as in 1880. It is quite certain, however, that the rail shipments will not be so large this year as last during these four months, and, judging by the August receipts, they will be less than in 1880 or 1879.

These facts may serve to indicate the prospects of the new trunk lines now under construction, and the effect they may have on the older roads with which they will compete.



### THE ACCIDENT IN THE FOURTH AVENUE TUNNEL.

To make the circumstances attending this accident, which occurred last Friday morning in the New York Central & Hudson River Railroad tunnel, clearly understood by those not familiar with the locality, a little preliminary description is needed. It should be said, first, that there are really three tunnels; a centre one in which there is a double track for through traffic, and two side tunnels, each having a single track for local or suburban trains, the centre one being separated from the side ones by walls and small arches on each side. Fig. 1 represents a rough plan, the double lines representing the tracks and the heavy black lines the side walls of the tunnels. The through traffic on the two middle tracks is operated on the block system, a modification of Rosseau's electric signals being used. The local traffic in the side tracks is not ordinarily worked on the block system, as there are only from 12 to 15 trains per day on each track.

Early on the morning of the accident, an engine on one of the main tracks broke an axle, which obstructed the line in the middle tunnel. Consequently the through south-bound traffic was turned on the side track at One Hundred and Twenty-fifth street, and while this was the case the trains were run on an extemporized block system, information concerning the movement of trains being given from one station to the other by the ordinary telegraph instrument, and the signals by a flag or lantern.

All went well, the trains being more or less delayed, however, until the Portchester train from the New York & New Haven road passed Ninety-sixth street station. It should be mentioned that the New York & New Haven Railroad has the right only to run trains over this line. The traffic through the tunnel is controlled by the managers of the New York Central & Hudson River Railroad.

Either just before or just after the Portchester train had passed Ninety-sixth street station, the signalman there was notified from One Hundred and Twenty-fifth street that it was the last through train which would be turned on the side track, the main line having then been cleared. Not unnaturally, therefore, the vigilance of the signalman at Ninety-sixth street was then somewhat relaxed, but unfortunately too soon. In his own testimony before the Coroner he said:

"Train No. 72, of the Central road, came down and stopped at his office, and he allowed it to proceed on receiving the signal from Eighty-sixth street. Then he gave no ice to One Hundred and Tenth street for another to come on. This was No. 70 (the Portchester train) of the New Haven road. When the latter reached Ninety-sixth street Eighty-sixth street had not yet reported No. 72 as clear, so he held New Haven from 8:49 to 8:56. After this New Haven passed out by signal and train; began running on the main track; when the New Haven stood at his office its head was at Ninety-seventh street; when his red flag was lowered it hung so low that it had to be raised to allow the train to pass under; he raised it on this occasion and the New Haven passed; witness immediately went inside the office, put down the leaving time of that train and reported the Eighty-sixth street and One Hundred and Tenth street, also that he had been very busy; he had quite a number of train reports to send to the train dispatcher as to the kind of trains and their time of passing; no other train was in sight, so witness said he went on with his reports; but he

slowly that two brakemen who had been left on the line to give signals came on board. At Eighty-sixth street the train was stopped again, and a brakeman went back, but did not get far enough to stop the Harlem train which was following, and which ran into the standing train, the last car of which was split open by the engine. Each side of the car was



FIG. 1.

thrown against the wall of the tunnel nearest to it and the locomotive crushed through the car for a considerable distance from its rear end.

One passenger was killed instantly, and another died in a few hours after, and about twenty were injured more or less seriously.

The primary cause of the accident was undoubtedly the failure of the signal-man at Ninety-sixth street to

the side lines was before. There is, therefore, very good reason for having the signal appliances for the side tracks just as perfect as they are for the main tracks or more so. The responsibility for not having them so probably rests where the authority to make the requisite expenditure does.

It is a disputed point whether there was time enough after the Portchester train stopped at Eighty-sixth street to send a man back to protect the rear by a proper signal. From the evidence it seems certain that the speed of this train was twice reduced by reason of exploding torpedoes, so that it was slow enough for two men to get on board. Now was it or was it not the duty of the conductor to send out a flagman, when he was merely delayed, without being stopped? If it was, then evidently some blame attaches to the conductor of the train for not obeying the rules.

The rules of the New York Central road say:

"Whenever a train is stopped on the road, or is only enabled to proceed at a slow rate, this conductor must immediately send a man with a red signal at least half a mile back."

Notwithstanding the fact that there was a failure on the conductor's part to obey this rule, the circumstances afford another illustration of the difficulty of having it obeyed with certainty under all circumstances. By the testimony in this case it appears that there were originally three brakemen on the train. One left it at Mount Vernon because he was sick, and another one was left at Melrose to give signals, so that there was but one brakeman remaining. Now, would it be wise to leave all the brakemen behind and run such a train into a crowded station without any? It is a question which, if the rule of protecting the rear of trains if faithfully obeyed, must often be answered. In fact, it seems probable that cases may arise when a train would not have enough men to send back if a signalman is left every time it is delayed. This reduces this rule to a *reductio ad absurdum* when it is applied to crowded lines on which there is not time to call in the men who are sent out to give signals, and shows, as has been so often shown before, that it is a very unsafe reliance, especially upon a road with many trains. The difficulty of having it obeyed under all circumstances has been commented upon in these columns before.\* The opinion was then expressed, "that it is practically impossible to have the rule obeyed with any reasonable degree of certainty." The present accident indicates, too, that, even if it could be, it gives a very limited degree of security on a line on which trains follow each other closely.

As stated above, the rear car of the Portchester train was literally split in two longitudinally, the engine penetrating at least half the length of the wrecked car, forcing one side of it one way and the other the other way, just as though a huge wedge had been driven into it. The question then arises, why did the car, apparently at least, offer so little resistance? In order to throw some light on this question the writer examined the wrecked car and made sketches and measurements from which the engraving, fig. 2—which is an inverted plan of the floor timbers—was made. From this engraving it will be seen that the only longitudinal timbers in the floor framing which extended the whole length of the car were the

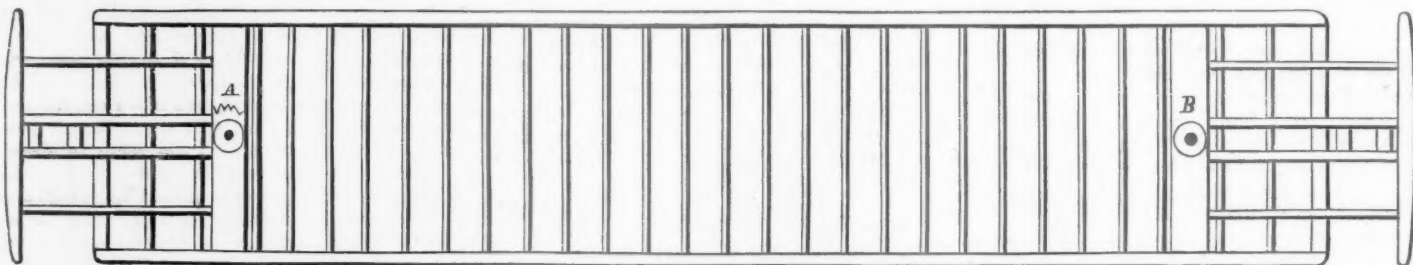


FIG. 2.

did not report that particular train out of its turn; other offices were also reporting at the same time, and he had a great deal of trouble to get in his reports to Eighty-sixth street and One Hundred and Tenth street; while engaged in giving these reports to the dispatcher, he saw a rapid transit train coming from Ninety-eighth street; at the same time the operator at Seventy-second street reported to operator at Eighty-sixth street, 'Train not clear yet; he went out at once and lowered his flag, knowing that Eighty-sixth street could not be clear; it had been raining and the rope attached to the flag was so twisted that he could not put it out in time before the rapid transit train passed into his station; with that witness telegraphed to Eighty-sixth street, 'Stop the rapid transit; the answer was, 'The brakeman will stop it; the New Haven train had got under headway and left witness at 8:56; the Harlem train passed down at 9:03, behind seven minutes. \* \* \* The reason of his not putting out flags after a New Haven train was a press of business on the wire, and his attention being called to the main track; as all trains were very much behind time he did not expect the rapid transit train."

Other evidence shows that the Portchester train after it left Ninety-sixth street exploded several torpedoes which had been placed on the track by preceding trains. Consequently it moved slowly—so

stop the Harlem train, and the chief responsibility for the accident must, therefore, rest upon his shoulders; and yet there are some mitigating circumstances which indicate how easy it would be for anyone to make the terrible mistake which he did. But although the chief blame must fall upon him, the responsibility does not end there. If, as he says, the rope by which he displayed his danger signal was so affected by the rain that it could not be operated promptly, it may well be asked why it is that on an especially dangerous part of the line, a wealthy company like the New York Central has no better appliances than such as become inoperative by a casual storm. It is true that signals like the one referred to are not ordinarily used for conducting the traffic on the main line, but it is not an unusual or unforeseeable thing to be obliged to turn the trains from the main tracks on to the side tracks, and the traffic on them is then attended with much greater risks than that on either the main or

two outside sills, which were  $6\frac{1}{2} \times 6\frac{1}{2}$  in. section. Between these there were transverse timbers of  $2\frac{1}{2} \times 6\frac{1}{2}$  in. section spaced about  $16\frac{1}{2}$  in. from centre to centre. Every alternate one of them was bolted to the side sill by a  $\frac{1}{4}$  in. joint-bolt. The Miller platform timbers were, it is true, attached to each end of the car, and butted up and were mortised into the bodybolsters in the usual way; but there was nothing but the *transverse strength* of the end sill, the body bolster and the cross pieces to resist concussions. These were broken like pipe stems. The attachment of the Miller platform to a car frame like this was like building a strong wall on a weak foundation. The bolster, which was made of wood, gave way on the irregular line at A, and as there was there hardly any resistance, the engine crushed through the other cross pieces as easily as an ox through a cane-brake. No argument will be used, and none is needed, to

\*See Railroad Gazette of Jan. 20 of this year, page 43.



prove the weakness of the system of framing in this car. The timbers which formed part of the Miller platform apparently resisted the shock without being crushed, but the system of framing is wretchedly weak, and has long since been abandoned by all car-builders who know their business. It is a sickening task, and one for which we have no inclination, to seek where the responsibility for the continued use of these cars rests. From creditable information we learn that there is a number of the same kind in constant use on the New Haven road. How few or how many, perhaps it is better for the public not to know, but if the directors of the New Haven road do not learn, and that speedily, they will incur a terrible responsibility. About two years ago in a collision while making a flying switch, one of these empty cars was split open near the Grand Central Depot in the same way that the one was demolished in the tunnel, so that the company or its officers have not been without warning. To continue to use cars framed in that way is to expose the lives of passengers who travel in them to a serious risk, to which they would not be subject in cars properly constructed. It of course cannot, or should not, be said that if the car in which the unfortunate passengers were either killed or injured had been framed with four or six strong longitudinal timbers between the outside sills, and extending the whole length of the car, no one would have been hurt; but it can be said, with certainty of being true, that a car framed in that way would have been immensely stronger than the one which was destroyed, and that a concussion which would crush the one would be securely resisted by the other.

It would be wrong to attempt to shield the New York Central Railroad for its share of responsibility for the accident. The signal system of a line with the amount of traffic that passes through the Fourth Avenue Tunnel daily should be so complete that there would be no danger to a train if it stopped anywhere or at any time.

When the committee appointed by the Senate of the state of New York was engaged in investigating the Spuyten Duyvil accident, one of the witnesses gave the following testimony:

"Question.—Do you suppose that if the block system had been used on the Central Railroad at the point at which the accident occurred, at Spuyten Duyvil, that accident could have occurred, or would have occurred?"

"Answer.—I do not think it would have been possible for it to have occurred under the block system, unless one signal man had made a mistake, and not only would it have been necessary for one signal man to make a mistake, but it would have been necessary to have had a coincidence of mistakes upon the part of the signal man and the locomotive runner in stopping at these points. These two things would have been obliged to coincide at the same time to have created the accident, and that places the probability of it so far beyond anything that is at all reasonable that it is not likely it would have occurred."

Quite singularly, in this tunnel accident, there was exactly such a coincidence of mistakes as referred to in the above testimony. A train was delayed and the signalman failed to block the track behind it, and, in addition thereto, the conductor of the delayed train failed to protect the rear of his train with signals, and, finally, when the collision occurred it was with a car pitifully weak and incapable, on account of its defective system of framing, to resist any severe collision.

Now, why is it that the very improbable coincidence referred to in the testimony quoted should have occurred on this same line, within a few months after the Spuyten Duyvil accident? The answer is plain. The wrecked train in the Spuyten Duyvil accident stopped in an unusual place; probably no passenger train was delayed near the place where the accident occurred once a year; so that it would have been in the highest degree improbable that a signalman there would have failed in his duty simultaneously with the delay referred to. In the tunnel the case was different. The southward traffic of three great lines was there concentrated on one track on the morning of the accident. The trains were all more or less delayed, were close together, the smoke in the tunnel prevented a train in front from being seen from the one following, so that a single error of a signalman was almost certain to cause an accident if there was sufficient delay of a front train for a rear one to catch up with it. Besides these circumstances, when trains are very close together, and there is delay at more places than there are brakemen to send out, obedience to the order to protect the rear becomes impossible.

Now what can be done in such cases, and how can a coincidence of such errors as that which caused the death and injury of nearly a score of people be prevented? As the *Evening Post* remarked in a recent article, "the Fourth Avenue Tunnel is as dangerous a bit of railroad as there is in the world." For this reason the most approved signaling appliances known should be used, and the most mature knowledge and experience should be employed to provide a signal

system which will give the highest degree of safety. Experimenting with untried inventions is out of place here. Happily there are several systems in use for preventing, or at least diminishing, the risk of a coincidence of mistakes like that described. If these are used, the starting signal at a station cannot be given to permit the entrance into a block section *without the consent and concurrent action of the signal-man at both ends of such block section*. Thus, if the line in the Fourth Avenue Tunnel had been provided with such appliances, it would have been impossible for the signal-man at Ninety-sixth street to give a signal "line clear" to the Portchester train *without the consent and concurrent action of the signal-man at Eighty-sixth street*. This makes the chance of a mistake many times less probable than it would be without such appliances.

As the Fourth Avenue line is only a few miles long, and as the New York Central is a rich corporation, there is no sufficient excuse, by reason of the cost of such appliances as have been described, for not using them. The nature of the traffic in the tunnel is of such a character that the public has not only a right to demand that ordinary safeguards be used, but to hold those who control expenditures in the highest degree culpable if they do not provide the *very best and most reliable appliances* for controlling their traffic which human ingenuity can devise, or the most mature knowledge suggest.

Of the New Haven Company it may be said that the sooner its cars constructed like the one that met with the accident are taken out of service the safer will be those who travel on its road. The responsibility for the continued use of such badly constructed equipment will rest with the board of directors, and it would, perhaps, be well if some of the daily papers would give more attention to the responsibility of these officers for accidents which occur and less censure to their servants, who are usually powerless to control the needed expenditures for proper equipment and safety appliances.

#### August Accidents.

Our record of train accidents for August, given in full on another page, shows for that month a total of 139 accidents, by which 46 persons were killed and 218 injured. There were 65 collisions, in which 27 persons were killed and 117 injured; 70 derailments, with 18 persons killed and 100 injured, and four other accidents, in which one person was killed and one injured.

Twenty-six accidents caused the death of one or more persons each; 28 caused injury but not death; while in 85, or 61.2 per cent. of the whole number, no serious injury to persons is recorded.

Twenty-six of the killed and 117 of the injured were railroad employes, while 20 of the killed and 101 of the injured were passengers or others riding on the trains, the number including several tramps stealing rides. Employes made up 56.5 per cent. of the number killed, 53.4 per cent. of that injured, and 54.2 per cent. of the whole number of casualties.

As compared with August, 1881, there was an increase of 10 accidents, of 15 in the number killed and of 151 in that injured, the number of injuries reported in August last year having been very small.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:		
Rear collisions.....	41	
Butting collisions.....	20	
Crossing collisions.....	4	
		65
DERAILMENTS:		
Broken rail.....	2	
Broken switch-road.....	1	
Broken bridge.....	4	
Spreading of rails.....	7	
Broken axle.....	4	
Broken wheel.....	2	
Broken truck.....	1	
Wash-out.....	5	
Accidental obstruction.....	4	
Cattle on track.....	8	
Misplaced switch.....	7	
Neglect to use signals.....	1	
Purposely misplaced switch.....	2	
Malicious obstruction.....	1	
Unexplained.....	21	
		70
Boiler explosion.....	1	
Broken connecting rod.....	1	
Broken crank-pin.....	1	
Broken axle, not causing derailment.....	1	
		4
Total.....		139

Five collisions are attributed to fog; five to mistakes in or failure to obey dispatchers' orders; four to misplaced switches; four to trains breaking in two, and one to runaway cars on a grade.

Of the four broken bridges one had been partly burned through before the train attempted to cross it. Two are reported as iron bridges, one of them about ten years old, the other comparatively new.

The general classification of these accidents is as follows:

Causes.	Collisions.	Derailments.	Other.	Total.
Defects of road.....	14	4	1	19
Defects of equipment.....	4	8	4	17
Negligence in operating.....	60	15	1	76
Unforeseen obstructions.....	1	15	1	17
Maliciously caused.....	1	3	1	5
Unexplained.....	21	21	1	43
Total.....		65	70	139

The proportion of accidents due to negligence in opera-

ting—that is those which might be prevented by more care among employes or by stricter discipline—was 49 per cent. of the whole number. There is no doubt that some of the others, to say nothing of the unexplained derailments, might properly be classed as preventable accidents.

Three malicious derailments are reported, one caused by an obstruction placed on the track and two by the misplacing of switches. The malicious collision was caused by some persons, said to be boys, taking off the brakes of cars left standing over night and allowing them to run down a steep grade and into a standing train.

The number of unexplained derailments is proportionally somewhat smaller than usual. In a few cases it is impossible to fix exactly the cause of a derailment, but the larger part are reported as unexplained on account of the too great brevity or vagueness of the reports of accidents received.

A division according to classes of trains and accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains.....	3	19	2	24
To a pass. and a freight.....	12	1	1	14
To freight trains.....	50	51	2	103
Total.....		65	70	139
Casualties:				
Killed by.....	27	18	1	46
Injured by.....	117	100	1	218
Total.....		144	118	262

Accidents happened thus to 204 trains, of which 39, or 19.1 per cent., were passenger trains, and 165, or 80.9 per cent., were freight trains. Even this proportion of passenger trains is probably much above the true one, for it is the accidents to passenger trains that excite attention and are pretty sure to be reported, while many freight run-offs are known only to the trainmen and their immediate superiors, and escape report unless they happen to cause delay to passenger trains. It is, however, true that accidents causing death or serious personal injury seldom escape notice.

There were 75 accidents in daylight and 63 in darkness, while in one case the time is not definitely given. The proportion of night accidents is somewhat greater than usual.

Probably the most noticeable feature of the month's record is the large number of collisions, and especially butting collisions. The butting collision is peculiarly an accident of management. A sudden storm, a land-slide, many other things which cannot well be foreseen, may cause derailments; a break-down, a fog or some such cause may explain a rear collision, but a butting collision in its nature presupposes carelessness or a mistake somewhere, and the blame is generally supposed to rest between the train dispatcher and the two men upon whom devolves the movement of the train itself, the conductor and the engineer. That such accidents should increase in number is not creditable.

Reference has often been made to the number of collisions resulting from broken trains. These made hardly as great a figure last month as usual, but there were enough to show that the strength of car-couplings needs attention.

A very common cause of rear collisions seems to be the running of trains so close together that, in case of a mishap to the first train, or a sudden stop from any cause, there is no time to warn and stop the next one. This is especially true of freight trains running in sections, as they are run on most roads with heavy traffic. Where there is no block system—and the block system is in use on comparatively very few miles of road—this will always be a source of danger. It does seem, however, that many of the accidents from this cause might be prevented by greater care, and this would certainly result from the holding of trainmen to a stricter responsibility, and from the general stiffening of discipline which is needed on so many roads.

Eleven accidents—seven derailments and four collisions—are reported from misplaced switches. One flagrant piece of carelessness is reported, where a bridge-gang removed a small bridge which they were about to replace, but neglected to put out any signals until a train had gone into the gap.

The weather of the month was generally favorable, and there was not an unusual number of what may be called the accidents of the season.

For the year ending with August, the record is as follows:

	Accidents.	Killed.	Injured.
September.....	144	56	227
October.....	131	31	183
November.....	133	50	120
December.....	113	36	96
January.....	137	41	198
February.....	88	23	69
March.....	99	29	101
April.....	81	13	61
May.....	94	24	66
June.....	72	35	183
July.....	92	18	56
August.....	139	46	218
Total.....		1,323	1,558
Totals, same months, 1880-81.....		1,401	1,518
" " " 1879-80.....		891	954
" " " 1878-79.....		841	758

The averages per day were, for the month, 4.48 accidents, 1.48 killed and 7.03 injured; for the year, 3.62 accidents, 1.08 killed and 4.27 injured.

The average casualties per accident for the month were 0.331 killed and 1.568 injured; for the year they were 0.298 killed and 1.178 injured.

The averages per month for the year were 110 accidents, 34 killed and 130 injured, against similar averages of 123 accidents, 20 killed and 79 injured in 1879-80; 70 accidents, 16 killed and 63 injured in 1878-79.

The number of accidents in August was exceeded in only one other month of the year; the number of killed in only two months, and that of injured in only one month. September, judging from the reports thus far received, is likely to have even a worse record than that of August.



## August Earnings of the Pennsylvania Railroad.

We pay special attention to the earnings and expenses of this railroad because its system is so large and shares to such an extent in the traffic of the whole country that its earnings probably represent better than those of any other one road the condition of railroad business of the country as a whole—certainly better than those of any other railroad that reports its earnings monthly.

But if we should accept the Pennsylvania's August earnings as a criterion for the whole country, we should be forced to conclude that railroad business was then much better than ever before in the history of the country; and we hasten to say that doubtless the Pennsylvania's lines in that month had a greater accession of traffic than the roads further north, or those south of the Ohio River. They more than any other great system, except that of the Baltimore & Ohio, drain the country which since the middle of July has been marketing the new crops, and this must have had a very great effect on their traffic.

For August the gross earnings of the Pennsylvania's lines east of Pittsburgh and Erie were \$861,201 (22½ per cent.) more this year than last. The working expenses were \$272,845 (11½ per cent.) greater, and the net earnings \$588,356 (40½ per cent.) greater. Nor is this great increase in earnings and profits due to small ones last year. On the contrary, the effect of the railroad war was less visible on the Pennsylvania than on almost any other road, at least until much later in the season. Last year its earnings in August were larger than in any previous month of the year except March and May, and larger than in any month of any preceding year since the months of heaviest Centennial travel. The net earnings were not so large in comparison, but they were just about equal to the average for the year.

For ten successive years the gross and net earnings and working expenses in August have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1877.....	\$3,416,711	\$2,257,910	\$1,158,801
1878.....	3,353,931	2,137,747	1,216,184
1879.....	3,220,063	1,949,587	1,270,476
1880.....	3,305,022	1,707,565	1,597,457
1881.....	2,784,115	1,609,097	1,174,018
1882.....	2,972,001	1,485,959	1,486,041
1883.....	2,982,714	1,725,718	1,257,000
1884.....	2,733,353	2,087,871	645,481
1885.....	3,809,978	2,365,472	1,444,506
1886.....	4,671,179	2,738,317	1,932,862

The increase in gross earnings over 1879 is 56½ per cent., and in net earnings it is 61½ per cent., in spite of an increase of 53 per cent. in expenses. The gross earnings are much larger than ever before in a month. The months where they have exceeded \$1,000,000 have been:

Year.	Month.	Earnings.
1877.....	September.....	\$4,099,196
1878.....	October.....	4,064,629
1882.....	May.....	4,118,877
".....	June.....	4,038,757
".....	July.....	4,149,150
".....	August.....	4,671,179

Though the working expenses in August were larger than ever before since 1873, the net earnings were the largest ever made except in September and October of 1876, when Centennial travel crowded the road. The largest net earnings previously since 1876 were \$1,799,226, in March, 1881. This gain of net earnings over August of last year is of itself equal about 0.7 per cent. on the present capital stock.

The excess of the net earnings of the lines leased and controlled west of Pittsburgh and Erie over the interest and rentals accruing in August was \$293,612, against \$212,640 in the entire seven months previous. This profit is, however, \$62,165 less than in August last year.

For the eight months ending with August the earnings and expenses of the lines east of Pittsburgh and Erie have been, for six successive years:

Year.	Gross earnings.	Expenses.	Net earnings.
1877.....	\$18,999,848	\$12,617,650	\$6,382,198
1878.....	19,911,272	13,077,215	6,834,057
1879.....	21,179,683	13,674,618	7,505,065
1880.....	26,663,774	16,634,618	10,029,156
1881.....	29,113,240	17,710,607	11,402,633
1882.....	31,471,178	19,601,249	11,869,929

Compared with last year there is an increase of \$2,326,943 (8 per cent.) in gross earnings, but a decrease of \$62,553 (½ per cent.) in net earnings, due to the enormous increase of \$2,393,493 (14 per cent.) in working expenses, which are 50 per cent. greater than in 1879. The gross earnings and expenses are much larger than in any other year, and the net earnings were exceeded only last year.

On all the lines west of Pittsburgh and Erie the excess of net earnings over interest and rentals for the eight months this year was \$506,252 against \$2,160,877 last year, \$1,611,963 in 1880, and a loss of \$422,753 in 1879. The decrease in these profits, compared with last year, is \$1,654,535, which added to the \$62,553 decrease in the net earnings of the eastern lines makes a falling-off of \$1,717,088 in the profits of the Pennsylvania Railroad Company—about 2 per cent. on its stock. This seems formidable; but two months earlier the decrease was no less than \$2,502,011, or 3 per cent. on the stock. At this rate the profits for the whole year will be quite as large as last year, which we believe may reasonably be expected. During the remaining four months last year there was a decrease of \$813,387 in the profits of the two systems, compared with 1880. Production was made light by the crop failures, and rates were ruinously low. Now there is plenty to carry and paying rates are obtained.

## The Late Ashbel Welch.

Ashbel Welch, one of the oldest and most distinguished of American engineers, died Sept. 25 at his home in Lambertville, N. J., after an illness which closed a period of more than a year of declining health.

Mr. Welch was born in Madison County, N. Y., Dec. 4,

1809. He was educated at the old Albany Academy, under Prof. Henry, afterwards of the Smithsonian Institution, and early developed those qualities which later gave him so high a standing in his profession. When 18 years old he began active life as an assistant to his brother, Sylvester Welch, who was then Engineer of the Lehigh Canal. Associated with him were Solomon W. Roberts, W. Milnor Roberts and Edward Miller, all afterwards well-known engineers.

In 1830 Mr. Welch entered the service of the Delaware & Raritan Canal Company, and in 1836 he was made Chief Engineer, becoming soon afterwards Chief Engineer also of the Camden & Amboy Railroad, when the railroad and canal companies united and became the "joint company," so well known in New Jersey. In this capacity he had full scope for his ability, and he was instrumental in introducing the T-rail, improved systems of signals and switches, the fish-joint, and many other improvements which lay at the foundation of modern railroading.

The present generation of engineers can hardly appreciate the difficulties which beset Mr. Welch, Mr. LaRocbe and their contemporaries. In their day there was no railroad practice and no body of experimental knowledge to which they could refer; everything was new, and they were compelled to rely upon themselves, making their own experiments and, as it were, creating the railroad system, whose future greatness Mr. Welch at least foresaw.

In 1850 and the two following years Mr. Welch located the Belvidere-Delaware road and superintended its construction, which involved much difficult work. In 1853 he had charge of the enlargement of the Delaware & Raritan Canal, a work which was completed in a remarkably short time, in spite of the many difficulties attending its execution in the winter season.

During all this time he had been intimately associated with Commodore Stockton, and rendered him great assistance in the building of the famous steam frigate "Princeton," and in his experiments in the construction of heavy ordnance.

In 1862 Mr. Welch was chosen Vice-President of the Camden & Amboy Railroad and the Delaware and Raritan Canal companies, and remained their chief executive officer until 1867, when a partial union with the New Jersey Railroad Company was arranged. He was then chosen President of the joint board of the Associated Companies, and held that position until the lease of the New Jersey roads to the Pennsylvania Railroad Company in 1871. Under the Pennsylvania he was Chief Engineer in charge of new works and improvements on the New Jersey lines for a time, and afterwards Consulting Engineer.

With increasing age he retired somewhat from active work, but was still deeply interested in his profession, and made some valuable contributions to engineering history. At the time of his death he was President of the United New Jersey Railroad & Canal Company, Consulting Engineer of the New York, West Shore & Buffalo road and President of the American Society of Civil Engineers—an institution of which he was one of the earliest and most useful members.

Mr. Welch's health has been failing for some time past, and his death was a shock, but hardly a surprise. The death of his wife some three years ago was a severe blow to him, from which, indeed, he never fully recovered. He leaves several children, all of them grown up.

Personally, Mr. Welch was the most upright of men, and was always a courteous gentleman, who will be sincerely mourned by very many friends who appreciated his personal qualities as well as his great abilities. He was almost the last of that generation of great engineers who created the American railroad, and whose life work is a worthy study and example for their successors.

## Record of New Railroad Construction.

This number of the Railroad Gazette contains information of the laying of track on new railroads as follows:

**Bartington, Cedar Rapids & Northern.**—Track on the Pacific Division is extended from Spirit Lake, Ia., northwest 15 miles.

**Chicago & Northwestern.**—Track on the Sioux Rapids Branch is extended from Peterson, Ia., west to Orange, 25 miles.

**Groesbe Valley.**—Track laid between Portageville, N. Y., and Nunda, 8 miles.

**Nevada & Oregon.**—Extended northward to Long Valley, Cal., 13 miles. Gauge, 3 feet.

**New Orleans & Northern.**—Track laid from Meridian, Miss., south by west to Enterprise, 27 miles. Gauge, 5 feet.

**Oregon Railway & Navigation Co.**—The Baker City Branch is extended southeast to Pendleton, Or., 5 miles.

**Pittsburgh, Chartiers & Youghiogheny.**—Track laid from Chartiers, Pa., west 5 miles.

**Toledo, Cincinnati & St. Louis.**—Track laid from Ramsay, Ill., west by south to Fillmore, 15 miles. Gauge, 3 feet.

**Western North Carolina.**—The track is extended southwest to Wayneville, N. C., 8 miles.

This is a total of 121 miles of new railroad, making 7,285 miles thus far this year, against 4,774 miles reported at the corresponding time in 1881, 3,607 miles in 1880, 2,224 miles in 1879, 1,267 miles in 1878, 1,396 miles in 1877, 1,677 miles in 1876, 834 miles in 1875, 1,396 miles in 1874, 2,778 miles in 1873 and 4,970 miles in 1872.

**CHICAGO RAIL SHIPMENTS EASTWARD** for the second and third weeks of September for three years have been, in tons:

Week to	1880.	1881.	1882.
Sept. 14.....	31,260	64,765	38,878
Sept. 21.....	33,844	63,855	35,611

Two weeks..... 65,104 128,620 72,489  
For the two weeks the shipments this year are 44 per

cent. less than last year, but 11½ per cent. more than in 1880, which was the year of largest profits from this traffic.

The gross earnings from the shipments for the two weeks must have been about at the rate of \$100 this year for every \$89 last year and \$108 in 1880.

The percentage of the total carried by each road in these weeks was:

Week to	C. & G. T.	Mich. Can.	Lake Shore.	Ft. Wayne.	P. C. & St. L. B. & O.
Sept. 14.....	14.3	21.1	21.5	28.3	7.8
" 21.....	11.6	23.7	17.9	29.1	10.5

These percentages do not vary greatly from the recent averages.

The shipments for seven successive weeks since July have been, in tons:

	Week to	Aug. 7.	Aug. 14.	Aug. 21.	Aug. 28.	Sept. 7.	Sept. 14.	Sept. 21.
24,813	22,921	27,087	37,902	38,106	36,878	35,611		

\* At that rate; being 56,877 tons for the ten days ending Aug. 31.

The falling off in the third week of September was, therefore, but trifling, and for four weeks shipments have been large and quite steady. The comparison with last year is of little significance, because of the rat-s then ruling; but if we go back to 1880 we find that the aggregate shipments for the corresponding four weeks then were 150,016 against 148,497 this year. In 1880 there was the remainder of the largest corn crop we ever had to be marketed, and the beginning of our largest wheat crop. In view of this, the shipments this year must be considered very satisfactory, and it is in fact somewhat surprising that so large a proportion of the grain shipped from lake ports goes by rail.

For the week ending Sept. 23 the shipments billed at Chicago (not including those billed from points further west to the East through Chicago, which are included in the above figures) were 27,187 tons, against 57,046 tons in the corresponding week of last year, and 29,813 tons in the previous week of this year. Compared with last year there is very little decrease in the provision shipments, but flour shipments have fallen off 37 per cent., and grain shipments 66½ per cent.

**THE ACTIVITY OF TRUNK LINE TRAFFIC** cannot be judged by the Chicago shipments alone, the east-bound even less than the west-bound. There are special circumstances which affect the Chicago traffic which do not apply to shipments from points further south. We have heretofore called attention to the fact that in spite of the bad harvest last year, shipments from Chicago in January and February last were much larger than ever before in those months, and in January they were larger than in any previous month. But in those months the total trunk line shipments were quite small; and in January the Chicago shipments were more than half of the total east-bound movement over the trunk lines. The crops were comparatively good in and north of the latitude of Chicago, and much worse further south; and speculation made prices so very high in the early part of the year that the farmers, who are no fools, burned their grain forward, and shippers also took advantage of the ruinously low rates then accepted between Chicago and the sea-board.

In the summer, however, only a part of the Chicago shipments go by rail, while most of the places much further south have no other convenient outlet; and in July and August it is the country further south that ships most of the wheat, the crop not being mature in the country which is peculiarly tributary to Chicago. Then the rail shipments from Chicago are a very much less proportion of the total shipments over the trunk lines. Last August the latter were nearly six times as great as the Chicago shipments, while in January they were not twice as great.

Our weekly statements show that the Chicago shipments recently have generally been not half as great as last year, but the falling off in the total east-bound movement over the trunk lines in August we understand to have been only about 15 per cent., though rates are nearly twice as high as last year.

The west-bound movement, which last year was greatly stimulated by the war rates, has been this month about one-fourth less than last year, but still much larger than in any preceding year. The present rates permit some shipments by the more indirect routes, which almost wholly ceased during the railroad war last year.

**THE PROSPECTS FOR A LARGE HOG TRAFFIC** are not very good. One of the most significant features of the September report of the Department of Agriculture is its statement of the stock of hogs in the country. It will be remembered that hogs have been very high for a year, so that there has been a strong inducement to increase the supply; but against this was the great scarcity of corn, which has made it very costly, and in many cases impossible, to maintain the usual stock. The latter has evidently had great effect, for the Department's correspondents report a decrease in the number of hogs compared with last year amounting to 25 per cent. in Kentucky, 29 in Ohio, 25 in Indiana, 34 in Illinois, 20 in Iowa, 30 in Missouri, 5 in Kansas, and 2 in Nebraska. These are the great corn and hog states, and so great a decrease in so important a product will be felt very decidedly in transportation and business. It is a loss, too, which cannot be made good in one year, as it takes time to breed and grow animals, though hogs multiply more rapidly than any other domestic animals.

In the Southern states there is also a very considerable decrease in the stock of hogs from 1 to 23 per cent. in the different states, and in the aggregate probably as much as 10 per cent. In the Eastern and Middle states there is a decrease, but it is small. No important hog-growing state reports an increase, unless Minnesota may be regarded as



such; it has 4 per cent. more than last year. The Northwestern roads will suffer most from this decline, but those which carry from the Northwest to the East will also suffer. It should be said that the decrease in movement has been great for many months, that is, that the reduced stock has already made its felt very distinctly. It is the winter movement which is heaviest, however, and then the falling-off will probably be felt more than heretofore.

**CANAL RATES** advanced half a cent a bushel Monday to 6 cents for corn and 6½ for wheat from Buffalo to Chicago. A break in the canal has interrupted navigation for about a week and caused shipments to be small, and doubtless has made the supply of boats at Buffalo unusually small.

Ocean rates have fallen, and this week were quoted at 3 d. and 3½ d. per bushel from New York by steam to Liverpool.

Lake rates have remained steady at 2½ cents a bushel for corn and 2½ for wheat from Chicago and Milwaukee to Buffalo. It is said that many sailing vessels lay idle rather than accept these rates, which is an indication that there will be no great advance later, as a small increase in the rate due to larger shipments would call out a large increase in tonnage.

**THE GRAIN SHIPMENTS DOWN THE MISSISSIPPI** have been quite steady since they were resumed, after the winter wheat harvest. Down to the middle of July, the total shipments this year had been 2,844,617 bushels, an average of 100,165 bushels per week. Since that date down to Sept. 16, nine weeks, the river shipments have been 2,651,334 bushels, or an average of 294,593 per week. But in these nine weeks the largest shipments of any one week were 372,561 bushels. In the same nine weeks the grain exports of New Orleans were 1,593,505 against 672,012 in all the rest of the year—that is, at the rate of 23,176 bushels per week down to July 23, and 190,188 bushels since. The business is not a very large one now, but the change in it since harvest is noticeable.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Meetings.

Meetings will be held as follows:  
Chicago & Eastern Illinois, annual meeting, at the office in Chicago, Oct. 3, at 10 a. m.  
Evansville & Terre Haute, annual meeting, at the office in Evansville, Ind., Oct. 16, at 11 a. m.  
Ohio & Mississippi, annual meeting, at the office in Cincinnati, O. t. 12, at 10 a. m.  
Buffalo, New York & Philadelphia, annual meeting, at the office in Buffalo, N. Y., Oct. 4. The transfer books close Sept. 28.

#### Railroad Conventions.

The Master Car-Builders' Association will meet in convention, pursuant to adjournment, on Oct. 10, at Niagara Falls.  
The Southern Railway Timbers Convention will meet at No. 46 Bond street in New York, Oct. 18.  
The Association of American Railroad Superintendents will hold its fourth meeting at No. 46 Bond street, New York, Oct. 18, beginning at 10 a. m.  
The Brotherhood of Locomotive Engineers will hold its annual convention in Louisville, Ky., beginning Oct. 18.  
The American Society of Mechanical Engineers will hold its stated annual meeting in New York, Nov. 2. Arrangements for the meeting will be announced hereafter.

#### Dividends.

Dividends have been declared as follows:  
Georgia (based on the Central, of Georgia, and the Louisville & Nashville), 2½ per cent., quarterly, payable Oct. 15.  
Chicago, Rock Island & Pacific 1½ per cent., quarterly, payable Nov. 1. Transfer books close Sept. 30.  
Dubuque & Sioux City (based on Illinois Central), 3 per cent., semi-annual, payable Oct. 16.  
Camden & Atlantic, 4 per cent. on preferred stock and 3 per cent. on common stock, payable Oct. 16.  
Cumberland Valley, 2½ per cent., quarterly, payable Oct. 2.  
Lake Shore & Michigan Southern, 2 per cent., quarterly, payable Nov. 1. Transfer books close Oct. 2.  
Danbury & Norwalk, 2½ per cent., semi-annual, payable Oct. 2. Transfer books close Sept. 25.

#### American Society of Mechanical Engineers.

The Secretary informs us that the following papers are already promised for the meeting on Nov. 2 next:  
"The Protective Value of Boiler Inspection," by Francis B. Allen.  
"Difficulties of Road Locomotion—Their Cause and Cure," by C. C. Hill, M. E.

#### Brotherhood of Locomotive Engineers.

The meeting of the Brotherhood in St. Louis last week came very near resulting in a strike of the engineers. The St. Louis Republican, of Sept. 22, says: "The locomotive engineers, who have been in session two or three days here, yesterday had a short conference with Mr. Talmage, and a committee presented him with the result of their deliberations. These were mainly determining what should be considered a day's work, and what the pay should be for a day's work. It is understood that Mr. Talmage gave a written response embodying his views of the matter, which it appears was not satisfactory to the committee, as it was not in compliance with their demands. Further time was given for a more explicit reply, at the end of which, no answer having been received, the engine is then telegraphed to Mr. Arthur, of Cleveland, the Grand Chief Engineer of the Brotherhood of Engineers in the United States and Canada, requesting him to come to St. Louis, as it is to his official that requests are made to act as a sort of umpire in such cases."

It was understood at first that the demands of the engineers had been finally refused, and arrangements were made for a general strike on all the Gould lines. Later, however, a compromise was proposed and accepted as appears in the following dispatch from St. Louis, Sept. 25: "The differences between the locomotive engineers on the Gould railroads and the officials of that system have been amicably settled and a strike prevented. P. M. Arthur, Grand Chief Engineer of the Brotherhood of Engineers, and a special committee of the Engineers' Convention, which is in session here, had a long conference with General Manager Talmage this noon, and the following schedule of wages was agreed upon: Three and a half cents per mile for passenger

engineers and 4 cents per mile for freight engineers; 100 miles or less to constitute a day's work, and all over 100 miles to be paid for at the same rate; engineers running pushers to receive \$90 per month, switch engineers \$80 per month; all detentions over two hours to be paid for at the rate of 35 cents per hour. These terms are somewhat under the original demands, but the engineers seem to be very well satisfied with them. It was further agreed that no engineer shall be discharged without a fair, impartial investigation, provided the engineer first submits his case in writing to the proper officers of his road, and if found innocent he is to receive half-pay for the time lost during the investigation."

In this case the engineers appear to have had a real grievance. Their statement was that the terms on which they have been heretofore paid were so indefinite that it was impossible for them to know what constituted a day's work, and that they were often called upon to make extremely long and fatiguing runs without any corresponding increase of pay.

#### Pittsburgh, Ft. Wayne & Chicago Railway Employees' Mutual Benefit Association.

The ninth annual convention of this Association met in Chicago, Sept. 19, and was opened with the usual formalities.

After the reading of the minutes of the last meeting President Wynkoop delivered his annual address, and in the opening alluded to Chicago in very complimentary terms for kindness and liberality in making complete arrangements for the present meeting of the convention. He reviewed the work accomplished by the Association, showing that, since its organization in 1874, it had paid to the heirs and beneficiaries of deceased members the generous sum of \$27,500 in 25 assessments. The annual cost to each member averaged \$18.50. The grand total of benefits since 1874 amounted to \$141,247.50. The number of certificates of membership issued to date was 3,172, of which 1,044 were forfeited, and 97 ceased to exist by reason of the death of the holder, leaving the actual assessable membership 2,024. During the past year the number admitted was 162. The increase of membership would have been larger if there had been a sufficient number of printed copies of the constitution and by-laws of the Association for distribution among railway employees. This deficiency, however, had since been remedied. The balance to the credit of the expense account was \$350.39. At present there were 98 divisions of the Association.

The reports of the General Secretary and Treasurer were presented, and committees appointed.

The Executive Committee presented reports on several disputed cases.

In the afternoon officers were chosen for the ensuing year. It was decided to hold the next meeting in Erie, Pa. Several amendments to the constitution were laid over until next year.

The disputed cases were decided, the usual routine business transacted and the convention adjourned.

### ELECTIONS AND APPOINTMENTS.

**Atlantic & Pacific.**—Mr. Charles R. Williams is appointed General Freight and Passenger Agent, with office at Albuquerque, N. M., in place of Mr. John W. Mass, who has gone to the Louisville and Nashville.

**Boston, Hoosac Tunnel & Western.**—Mr. H. L. Morrill has been appointed General Manager. He was recently Superintendent of Construction of the New York, Chicago & St. Louis road.

**Boston, Revere Beach & Lynn.**—Mr. Charles A. Hammond, late Master of Construction and Maintenance, has been appointed Superintendent of the road.

**Cincinnati, Hamilton & Dayton.**—Mr. E. M. Bronson has been appointed General Traveling Passenger Agent. He was recently on the Ohio & Mississippi.

**Danville, Olney & Ohio River.**—At the annual meeting in Kansas, Mo., the old board was re-elected and the following officers chosen: President, Parker C. Chandler; Vice-President and General Manager, James R. Maxwell; Secretary, Wm. H. Brown; Treasurer, Charles A. Hovey. Mr. Maxwell has been heretofore Chief Engineer.

**Genesee Valley.**—Mr. Robert M. Patterson has been appointed Superintendent, with office in Rochester, N. Y.

**Indianapolis & St. Louis.**—The officers of this company as reorganized are: President, J. H. Doreaux; Vice-President, Stevenson Burke; General Manager, E. B. Thomas; Secretary and Treasurer, George H. Russell.

**Lewish & Hudson River.**—Mr. Frank E. Smith is appointed General Freight and Passenger Agent, with office at Warwick, N. Y. He was recently Eastern Traveling Agent of the Chicago, Milwaukee & St. Paul.

**Maine Central.**—Mr. F. W. Cram is appointed General Eastern Freight Agent, and will have charge of the freight business east of Bangor, Me., with office in Bangor. Mr. W. S. Eaton is appointed General Western Freight Agent, and will have charge of the freight business west of Bangor, with office in Portland, Me. Mr. Cram was recently Superintendent and General Freight Agent of the European & North American road, now transferred to this company under lease.

**Master Car-Finishers' Association.**—At the annual convention last week the old officers were re-elected as follows: President, D. D. Robertson, Michigan Central, Detroit; Vice-President, John Rattenbury, Chicago, Rock Island & Pacific, Chicago; Secretary and Treasurer, R. McKeon, New York, Pennsylvania & Ohio, Kent, Ohio.

**Minneapolis & St. Louis.**—Mr. L. F. Kimball is appointed General Northern Freight Agent, with office in St. Paul, Minn.

**Missouri Pacific.**—Mr. C. L. Leslie has been appointed Assistant Superintendent of the International & Great Northern Division, with office at Palestine, Tex. He will have especial charge of the distribution of cars.

**Nashville, Chattanooga & St. Louis.**—Mr. C. F. Jackson has been appointed Car Accountant, in place of Richard McKinney, resigned.

**New York, Chicago & St. Louis.**—The following appointments are announced by the General Freight Agent: Commercial Agent at Cleveland, W. B. Thurber; Commercial Agent at Toledo, D. Blinn; Commercial Agent at Chicago, N. A. Skinner; Local Freight Agent at Chicago, J. E. Lockwood.

**New York, Pennsylvania & Ohio.**—Acting General Manager J. M. Ferris has been appointed General Manager, Mr. P. D. Cooper resigning on account of continued ill-health.

**Northern Central.**—Mr. A. J. Cassatt having resigned the office of Vice-President, the following appointments have been made: Vice-President, Frank Thomson; General

Manager, Charles E. Pugh; General Superintendent Baltimore Division, G. C. Wilkins; Superintendent Shamokin Division, Alfred Walter in place of F. L. Sheppard, transferred. These appointments result from the corresponding changes on the Pennsylvania Railroad.

**Northern Pacific.**—At the annual meeting in New York, Sept. 21, the following directors were chosen: Benjamin P. Cheney, J. L. Stackpole, Boston; John C. Bullitt, Philadelphia; Henry E. Johnston, Baltimore; Ashbel H. Barney, August Belmont, Fredrick Billings, John W. Ellis, Robert Harris, Jr., J. Pierpont Morgan, Thomas F. Oakes, Rosewell G. Rolston, Henry Villard, New York. The new directors are Messrs. Belmont, Bullitt, Johnson and Morgan. The board re-elected Henry Villard, President; Thomas F. Oakes, Vice-President; Anthony J. Thomas, Second Vice-President; Samuel Wilkeson, Secretary; R. Lenox Belknap, Treasurer; George Gray, General Counsel.

**Ohio River & Indiana.**—The officers of this new company are: President, Isaac B. Hymer; Vice-President, James Wilson, Jr.; Secretary, C. A. Layton; Treasurer, J. C. Hassenier.

**Pennsylvania.**—Mr. John Whittaker has been appointed Assistant General Freight Agent, with office in Philadelphia.

Mr. O. J. Greer (Line Freight Agent in New York) succeeds Mr. Whittaker as General Agent for New York and New England, with office in New York.

**Pittsburgh, Cincinnati & St. Louis.**—Mr. W. W. Reynolds is appointed Master Mechanic of the Second and Third divisions, Columbus, Chicago & Indiana Central line, in place of George H. Prescott, who has gone to the Vandalia line. Mr. Reynolds has been on the New York Division of the Pennsylvania Railroad. His office is at Logansport, Ind.

**Pittsburgh, Ft. Wayne & Chicago Railway Employees' Mutual Benefit Association.**—At the annual meeting in Chicago, Sept. 19, the following officers were chosen: President, H. W. Wynkoop, Crestline, O.; Vice-President, Thomas Adams, Chicago; T. Gray, G. J. Parkin, Allegheny; General Secretary, T. M. Layton, Crestline, O.; Treasurer, J. J. Kirkland, Crestline, O.; Executive Committee, J. M. Ralphy, T. J. Hutchinson, J. K. McCracken, Amos Baer, M. Jenkins; Auditing Committee, D. L. Zink, Isaac Howey, E. Fedler.

**St. Paul, Minneapolis & Manitoba.**—Mr. W. S. Kemp has been appointed Assistant Superintendent of the Breckenridge Division.

General Superintendent S. R. Stimson has issued the following circular:

"Mr. C. C. Wrenshall having resigned the position of Master of Roads the office is abolished, and the following appointments are announced: J. C. Brennan, Road-Master of Fergus Falls Division, with headquarters at St. Paul; J. W. Mayer, Road-Master of Breckenridge Division, including branches and extensions, with headquarters at Deano, Minn.; M. Marston, Road-Master of Northern Division, including branches and extensions, with headquarters at Crookston, Minn. Road-masters will be accountable to division superintendents, and will make requisitions on them for all material and supplies required. They will also select their own assistants, subject to the approval of the General Superintendent. The office of Master of Roads having been abolished, until further notice the bridges, buildings and water supply of this company will be in charge of Mr. N. D. Miller, Assistant Engineer, with headquarters at St. Paul."

A St. Paul dispatch says that Mr. W. S. Alexander, heretofore General Freight Agent, will be hereafter General Traffic Manager. He will be succeeded as General Freight Agent by Mr. A. L. Mahler, late of the Burlington, Cedar Rapids & Northern.

Mr. A. H. Bode is to be Assistant to the President. He is now Traffic Manager of the Minneapolis & St. Louis.

### PERSONAL.

—Mr. Richard McKinney has resigned his position as Car Accountant of the Nashville, Chattanooga & St. Louis road.

—Mr. Leonard C. Legro has resigned his position as Master of Transportation of the Boston, Revere Beach & Lynn road.

—It is reported that Mr. C. G. Warner has resigned his position as Auditor of the Missouri Pacific Railroad and its leased and controlled line.

—Mr. Ashbel Welch, President of the United New Jersey Railroad & Canal Company and of the American Society of Civil Engineers, died in Lambertville, N. J., Sept. 25, aged 73 years. A more extended notice will be found elsewhere.

—Mr. P. D. Cooper, General Manager of the New York, Pennsylvania & Ohio road was given leave of absence on account of ill health several months ago. His health has not at all improved, and he has now, for that reason, tendered his resignation and it has been accepted.

—It is reported that Mr. J. N. Linder, Superintendent of Motive Power on the Boston, Lowell & Concord Line, has accepted the appointment of General Superintendent of the Northern Division of the Mexican Central Railroad, with headquarters at El Paso.

—Mr. Samuel J. Hayes, Superintendent of Machinery of the Illinois Central Railroad and Treasurer of the Master Mechanics' Association, died at his residence in Chicago, Sept. 21, aged 66 years. A more extended account of Mr. Hayes' life and work will be found elsewhere.

—Mr. Wm. Walter Phelps, who has been nominated for Congress by the Republicans of the Fifth District of New Jersey, is a large owner of railroad property and a director of the Delaware, Lackawanna & Western and several of its allied companies, the Houston & Texas Central and the New Haven & Northampton. Mr. Phelps was once before (in 1872) elected to Congress from the same district, and served one term with distinction.

### TRAFFIC AND EARNINGS.

#### Chicago Traffic Contracts.

The representatives of the Chicago & Northwestern, the Chicago, Milwaukee & St. Paul, the Chicago, Burlington & Quincy, and the Chicago, Rock Island & Pacific Railroad Companies met in Chicago, Sept. 22, and signed the agreement made the previous day, thus averting the threatened war in regard to Northwestern business. The agreement on the passenger traffic is to maintain rates. The Rock Island road is allowed to issue to shippers only a special ticket at a rate equalizing it with the \$20 thousand-mile tickets of the Northwestern and St. Paul roads. The agreement is to go into effect Oct. 7, and is to last one year. The Chicago, Milwaukee & St. Paul road is admitted to the Iowa pool on equal terms with the other roads. The freight traffic agreement for the maintenance of rates was also signed by the companies. The minor details of the schedule will not be



completed for some days. The freight agents of the agreeing roads were to meet in Milwaukee on Monday for the purpose of taking the matter up. These agreements cover not only the traffic to St. Paul, Minn., but to all Northwestern points.

#### Railroad Earnings.

Earnings for various periods are reported as follows:

Eight months ending Aug. 31:				
	1882.	1881.	Inc. or Dec.	P. c.
Buff. Pitts. & W.	\$557,302	\$425,875	I.	\$131,427 30.9
Net earnings...	289,856	135,949	I.	153,907 112.5
Ch. N. O. & T. P.	1,007,974	1,422,146	I.	185,828 13.1
Des. M. & Ft. Dge.	223,868	243,402	D.	19,534 8.0
N. Ch. & St. L.	1,216,040	1,397,972	D.	181,932 13.0
Net earnings...	540,899	585,235	D.	44,336 7.6
Norfolk & West.	1,438,655	1,384,627	I.	54,028 3.9
Net earnings...	604,823	616,231	D.	11,408 1.8
Northern Central.	3,828,842	3,600,688	I.	228,154 6.3
Net earnings...	1,472,237	1,193,030	I.	279,207 23.4
Pennsylvania.	3,147,178	29,144,235	I.	2,326,943 7.9
Net earnings...	1,368,879	11,932,432	D.	62,553 0.5
Phila. & Reading.	13,553,949	12,973,801	I.	580,148 4.5
Net earnings...	2,739,221	5,739,067	I.	27,583 0.5
Rich. & Danville.	2,203,050	2,124,893	I.	78,157 3.7
Utah Central.	1,011,006			
Net earnings...	802,880	804,615	I.	58,271 7.2
West Jersey.	778,992	686,945	I.	91,957 13.4
Net earnings...	365,198	308,849	I.	56,349 18.8
Seven months ending July 31:				
Gr. Rapids & Ind.	\$1,391,438	\$1,240,294	I.	\$142,194 11.0
Month of August:				
Buff. Pitts. & W.	\$91,422	\$72,009	I.	\$19,413 27.0
Net earnings...	43,761	31,993	I.	11,768 36.7
Ch. N. O. & T. P.	228,119	227,740	I.	679 0.3
Des. M. & Ft. Dge.	28,242	31,450	D.	23,208 43.1
Ant.	150,000	112,000	I.	38,000 33.9
Nash. Ch. & St. L.	168,304	168,317	D.	13 0.0
Net earnings...	68,293	67,500	I.	793 1.1
Norfolk & West.	222,161	196,124	I.	26,038 13.3
Net earnings...	115,621	90,398	I.	25,223 23.5
Northern Central.	667,488	498,008	I.	169,480 34.0
Net earnings...	371,221	31,335	I.	276,886 204.0
Oregon & Cal.	80,300			
Pennsylvania.	4,671,179	3,809,978	I.	861,201 22.6
Net earnings...	2,932,492	1,444,506	I.	1,487,986 103.7
Phila. & Reading.	1,975,993	2,100,987	D.	24,094 1.2
Net earnings...	950,085	1,030,703	D.	54,678 5.3
Rich. & Danville.	290,034	294,837	I.	4,803 1.6
Utah Central.	120,877	102,316	I.	18,561 18.1
Net earnings...	61,055	57,567	I.	3,488 5.7
Va. Midland.	139,053	134,834	I.	4,219 3.1
West Jersey.	199,246	174,548	I.	24,698 14.7
Net earnings...	109,296	102,624	I.	6,672 6.5
Second week in September:				
Ch. & Eastern Ill.	\$39,394	\$33,855	I.	\$5,539 16.1
Ch. & Gt. Trunk.	47,390	32,054	I.	15,336 47.8
Grand Trunk.	368,155	337,812	I.	30,343 9.0
Third week in September:				
Ch. & Northwest.	\$346,343	\$515,400	I.	\$169,057 48.8
Denver & R. G.	139,784	144,261	D.	4,477 3.1
Louisv. & Nash.	254,195	222,700	I.	31,495 14.1
Northern Pacific.	200,000	101,290	I.	98,710 97.7
St. P., Minn. & M.	190,809	112,800	I.	78,009 69.0

Grand Trunk earnings now include those of the former Great Western Railway.

#### Petroleum.

Stowell's Petroleum Reporter gives the product of the oil regions of Pennsylvania and New York for August as follows, in barrels of 42 gallons:

	1882.	1881.	Inc. or Dec.	P. c.
Production.....	3,104,495	2,331,727	I.	772,768 33.1
Shipments.....	2,447,45	2,214,877	D.	167,328 7.5
Stock Aug. 31.....	31,772,094	25,035,187	I.	6,736,907 25.1
Producing wells.....	19,600	17,250	I.	2,350 13.6

The production was exceeded in July, but in no other previous month on the record. Very nearly two-thirds of it was from the Bradford and Allegheny districts, the new Northern fields.

The shipments were exceeded in June and July, and in four months of last year.

Of the stock reported 840,954 barrels were at the wells, 100,000 in private tanks, and 31,331,140 barrels in the pipe lines and tanks.

There were 253 new wells completed in August, and 194 started drilling during the month.

The shipments for the month were as follows:

	Barrels.	P. c. of total.
New York.....	813,234	39.7
Philadelphia.....	247,971	12.1
Baltimore.....	66,490	3.5
Cleveland.....	473,571	23.1
Pittsburgh.....	106,797	5.2
Local points.....	154,429	7.5
Refined at Creek refineries.....	185,063	8.9
Total.....	2,047,545	100.0

Shipments of oil refined at Creek refineries (reduced to its equivalent in crude) were as follows: New York, 93,718; Philadelphia, 2,463; Baltimore, 2,004; Boston, 58,084; local points, 26,844; total, 185,063 barrels.

#### Texas Refrigerator Line.

A company to be known as the Texas Continental Transportation Co., to engage in carrying dressed beef in refrigerator cars from the Southwest, was formed in Chicago, Sept. 2. Its operations will be confined to the Huntington system of railways, with the Chesapeake & Ohio as an eastern outlet, and the Southern Pacific as a western outlet.

#### Crops.

The state authorities of Minnesota have collected statistics of acreage and estimated production, which compare as follows with last year:

	1882.	1881.	Yield, bushels.
Corn.....	720,430	474,989	22,092,900 14,528,359
Wheat.....	2,547,677	2,063,984	43,036,080 32,683,162
Oats.....	845,119	737,497	31,110,379 22,018,658
Barley.....	308,287	203,349	8,138,776 4,150,913
Potatoes.....	54,148	43,817	5,306,304 4,688,419
Total.....	4,481,661	4,223,638	108,685,019 78,069,511

Thus, with an increase of only 58,025 acres (5% per cent.), there is an increase of no less than 30,615,508 bushels (39 per cent.) in the product. The estimated yields for this year seem pretty high, however. They are 30 bushels an acre for corn, 16½ for wheat, 36.8 for oats, 26.4 for barley, and 98 for potatoes.

It is reported that the officers of the Northern Pacific estimate the yield of wheat on the line in Dakota at 9,500,000 bushels. The Manitoba has estimated the production in the counties on its Dakota lines at 8,550,000 bushels. Two of these counties where production is estimated at 4,430,000 bushels are also in the Northern Pacific.

According to these estimates, the production of North Dakota this year is 13,620,000 bushels; which is probably exaggerated. But by these estimates Minnesota and North Dakota together have produced but little more than the state of Illinois.

Excessive heat and drought in August and the first half of September have reduced somewhat the promised great yield of corn in Kansas, leaving it large, however.

Frost came in Minnesota, injuring some late corn,

especially on low ground. It is estimated that perhaps 10 per cent. of the crop is damaged. On the night of the 21st there was frost in Northern Illinois, doing similar injury. The crop is later in Illinois than further north, and a severe frost even now would injure a good deal of corn. A little damage to corn in Nebraska is reported, though the frosts have been quite severe. There seems to have been more damage in Illinois south of the Northwestern road and north of the latitude of Peoria than elsewhere.

#### Grain Movement.

For the week ending Sept. 9 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Northwestern shipments.				
Year.	Northwestern receipts.	Total.	By rail.	P. c. by rail.
1876.....	4,360,091	4,089,315	1,820,361	44.5
1877.....	6,635,480	5,040,528	1,082,128	21.5
1878.....	5,851,401	4,852,847	994,118	20.5
1879.....	6,573,503	6,107,358	1,299,302	21.3
1880.....	7,194,477	6,928,509	1,914,231	39.0
1881.....	6,597,238	5,218,890	2,558,588	48.4
1882.....	5,897,365	5,144,840	2,144,813	42.8

The receipts of the Northwestern markets were smaller than in any corresponding week but one since 1876, and 500,000 bushels (8½ per cent.) less than last year. They were nearly the same as in the previous week of this year. The shipments of these markets were exceeded in the corresponding weeks of 1877, 1879 and 1881, but not greatly, except in 1879. They were, however, the smallest for four weeks this year. The rail shipments have been exceeded in no corresponding week since, except last year, when the rates were but half as great, but they were less than any of the three weeks next previous this year. The earnings from them must have been about at the rate of \$100 this year to every \$59½ last year, and \$107 in 1880. The shipments down the Mississippi were 315,507 bushels, or 6.3 per cent. of the whole. The Atlantic receipts were smaller than in any corresponding week since 1877, and 702,000 bushels less than last year. They were a trifle greater than in the previous week of this year, but with that exception were the smallest since July.

Of the Northwestern receipts, Chicago had 50.8 per cent., Toledo 15.8, St. Louis 15.5, Milwaukee 5.2, Peoria 4.9, Detroit 4, Duluth 2.8, and Cleveland 1 per cent. Toledo takes the second rank, which has very rarely happened in the last two or three years. Milwaukee begins to feel the spring wheat crop, and its receipts are the largest since May, and, with one exception, the largest since February. Duluth also shows that there has been some wheat marketed from the Red River valley, its receipts being nearly as large as in the whole month of August.

Of the Atlantic receipts New York had 54.8 per cent., Baltimore 14.3, Boston 10.8, Philadelphia 9, New Orleans 8.3, Montreal 2.5, and Portland 0.3 per cent. New York's percentage is the largest for nine weeks; Baltimore's the smallest since the middle of July, and its receipts are the smallest in amount since the third week of July. The receipts at Boston are the largest since May, and nearly twice as great as the average in August.

Of the exports for this week 37.2 per cent. were from New York, 21.1 from Baltimore, 14.3 from New Orleans, 11.6 from Philadelphia, 11.3 from Montreal, and 4.4 per cent. from Boston.

For the week ending Sept. 20 the Atlantic exports were 3,310,414 bushels of grain and 165,708 barrels of flour this year, against 3,190,029 bushels and 53,971 barrels last year, and 5,114,389 bushels and 97,970 barrels in 1880. The immense increase in flour is noticeable, and has been for some time.

For the week ending Sept. 23 receipts and shipments at Chicago and Milwaukee have been:

	1882.	1881.	1882.	1881.
Chicago.....	2,798,051	3,358,681	2,441,353	2,808,187
Milwaukee.....	38,734	347,727	152,569	142,208

Both..... 3,126,785 3,707,408 2,593,922 2,950,395

The Milwaukee receipts are larger than heretofore. For this week ending Sept. 23 receipts and shipments at Buffalo were:

	1882.	1881.	1882.	1881.
By rail.....	746,500	713,200	973,500	1,209,400
By water.....	1,898,200	1,473,000	593,020	1,095,000
Total.....	2,644,700	2,186,200	1,566,520	2,904,400

There is an increase of 21 per cent. in total receipts, but a decrease of 46 per cent. in shipments, which decrease is chiefly by canal, due probably to the break which has interrupted navigation.

For the week ending Sept. 21 receipts at four Eastern ports have been:

	Bushels: New York.	Boston.	Phila.	Baltimore.	Total.
1882.....	2,730,278	267,925	244,150	676,686	3,919,039
1881.....	2,351,495	267,247	591,550	679,110	3,889,402
P. c. of total:					
1882.....	69.7	6.8	6.2	17.3	100.0
1881.....	60.4	6.9	15.2	17.5	100.0

There is very little difference in the total receipts for the two years, or in those at Buffalo and Baltimore, but there is a decrease of 347,400 bushels (58½ per cent.) at Philadelphia, balanced by an increase at New York.

For eight successive weeks receipts and shipments of wheat, corn and oats at Peoria, Indianapolis, Chicago, Milwaukee, Detroit and Toledo, have been:

	Receipts.			Shipments.		
Week to	Wheat.	Corn.	Oats.	Wheat.	Corn.	Oats.
Aug. 7.....	1,794,228	1,094,792	518,235	2,248,733	95,051	442,577
Aug. 14.....	96,381	1,067,498	585,300	1,324,449	43,102	492,523
Aug. 21.....	1,189,833	1,370,020	1,372,098	1,297,303	1,185,078	83,174
Aug. 28.....	1,383,983	1,548,280	1,908,715	1,243,804	1,246,792	1,644,622
Sept. 4.....	2,424,191	1,649,956	1,991,799	1,381,105	1,391,477	1,573,883
Sept. 11.....	2,245,324	1,487,744	1,182,715	1,304,397	710,007	1,463,396
Sept. 18.....	2,128,777	1,210,905	890,459	1,767,394	1,383,769	966,963
Sept. 25.....	2,129,193	1,550,148	638,760	1,790,287	920,394	940,944

The wheat receipts and shipments keep up well, but do not increase as was expected about this time, when the spring wheat can be marketed. The corn receipts are larger than was anticipated, the farmers marketing the surplus held for their own wants in case this year's crop should meet some disaster, but the movement of oats, lately very large, to take the place of corn, has fallen off to about ordinary proportions.

#### Coal Movement.

The coal tonnages reported for the week ending Sept. 16 are as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Anthracite.....	732,481	616,678	I.	85,803 13.3
Semi-bituminous.....	111,903	93,440	I.	18,464 19.8
Bituminous, Penn.....	61,514	41,237	I.	20,277 49.2
Coke, Pa.....	49,194	45,414	I.	3,780 8.3

Anthracite coal markets are reported quiet and dull, with prices unchanged, although the domestic demand is improving, and some of the companies are said to be short of the smaller sizes. A slight increase in prices will be made Oct. 1. The Clearfield production is limited by a short supply of cars, of which much complaint is made.

The coal tonnage of the Pennsylvania Railroad for the week ending Sept. 16 was: Coal, 178,988; coke, 49,194;

total, 233,182 tons. The total tonnage this year to Sept. 16 was 7,750,182 tons.

The anthracite coal mine up Slate River, Gunnison County, Col., which Mr. Howard F. Smith has been working more or less, has finally passed into the hands of a wealthy company, which has determined to proceed with development at once. The company is known as the Anthracite Mesa Coal Co., organized with a capital stock of \$300,000, with the following officers: W. A. Bell, President; D. C. Dodge, Vice-President; Howard F. Smith, Secretary and Treasurer. Within 40 days from date, it is expected that the Denver & Rio Grande track will be completed up the river to a point to which a tramway will be built. Mr. Smith has started for Pennsylvania to secure the necessary breakers, crushers and screeners for a thorough mining of anthracite coal; and as soon as this machinery arrives, which is expected to be here in 60 days, it will be put in, and the work of shipping coal begun.—Crested Butte (Col.) Republican.

Cumberland coal shipments for the week ending Sept. 23 were 53,298 tons. Of the shipments from the mines, 35,180 tons were over the Cumberland & Pennsylvania road, 11,332 tons over the George's Creek & Cumberland, and 6,508 tons over the West Virginia Central & Pittsburgh. The total shipments this year to Sept. 23 were 820,595 tons.

#### Rates on Texas Cotton.

Commissioner Fink has just issued the following circular regarding rates on Texas cotton:

"At a meeting of the Trunk Line Executive Committee, held Wednesday, Sept. 20, 1882, a communication from Mr. S. Frink, General Freight Agent of the Missouri Pacific and St. Louis, Iron Mountain & Southern Railways, was read, in which he stated that his line was unwilling to accept a prorate on Texas cotton, as by the New Orleans route it would secure its full local rates. He suggested that the lines east of the Mississippi River should establish low rates from Mississippi River points, to apply on Texas business only.

"It was decided that the suggestion of Mr. Frink could not be adopted, and that rates on Texas cotton must be prorated through as provided in Joint Executive Committee Circular No. 402.

"The request of Mr. D. B. Morey, General Freight Agent of the Chicago, St. Louis & New Orleans Railroad, that he be authorized to make special rates from New Orleans to eastern cities on cotton coming from Texas in competition with the steamship lines, was considered, and it was decided to decline the request.

#### RAILROAD LAW.

##### Decisions of the Iowa Railroad Commission.

The Board of Railroad Commissioners recently decided a case of alleged discrimination, under Sec. 11, Chap. 77, laws 1878.

"No railroad corporation shall charge, demand, or receive from any person, company, or corporation for the transportation, or for any other service, a greater sum than it shall at the same time charge, demand, or receive from any other person, company, or corporation for a like service from the same place, or upon like conditions or under similar circumstances; and all concessions of rates, drawbacks, and contracts for special rates shall be open to and allowed all persons, companies, and corporations alike, at the same rate per ton per mile by car-load, upon like condition and under similar circumstances."

A shipped four cars of brick from Riverton to Randolph, on the Chicago, Burlington & Quincy Road, to be used in a stone building, and was charged \$27 per car freightage, or the regular tariff. B shipped the same number of cars, from the same to the same point, the brick to be used in an engine-house of a railroad grain elevator. The rate charged was \$20 per car. A complained of unjust discrimination. The Commissioners held that the law above quoted authorizes special rates. The local business of the railroads and the public convenience require elevators to complete the transporting power of railroads. Railroad companies generally see to it that elevators are built that the station may get its share of business. The storekeeper is assured more trade after the elevator is built, and is far her assured of its continuance by every safeguard that can be added to it. Elevators are often built by public enterprise, to assure general convenience, the railroad companies hauling the material, usually at reduced



is approaching completion, the shop at Rome, N. Y., which will soon be ready for business. It is said, however, that the new shop at Schenectady will certainly be built.

#### Car Notes.

The new firm of G. A. Morrison & Co., No. 12 Cortlandt street, New York, have been made general agents for the introduction and sale of the Tallman automatic brake. This brake is now in use on the New York & Harlem, and other roads, and a special trial of it was made and reported by a committee of the Master Car Builder's Association at its last annual meeting.

The Canton Car Co. in Canton, O., has just completed 50 box and 25 stock cars for the Cleveland, Akron & Columbus road.

The shops of Pullman's Palace Car Co. at Pullman, Ill., are building for the New York, Chicago & St. Louis road a special train, which consists of one baggage-car, one smoking-car, one dining-car and two sleepers. The platforms are to be inclosed, thus making it practically one continuous car. The sleepers are of the standard make and latest design, and are most beautifully decorated. Beside this train the Pullman Company has ready for immediate delivery to the "Nickel Plate" road the following equipment: 24 first-class passenger coaches, 10 second-class passenger coaches, 4 baggage and mail cars and 10 baggage cars. The Pullman Co. has the contract for the sleeping-car service on the line, and by the terms of the same it is to furnish enough of their latest style cars to accommodate all demands. It has just delivered to the Northern Pacific road six sleepers, to the Union Pacific six, to the Chicago, Burlington & Quincy Railroad eight, to the Chicago, St. Louis & New Orleans two, and to the Chesapeake & Ohio four. There will soon be delivered to the Texas & St. Louis narrow-gauge road its entire passenger equipment, including eight baggage and mail cars, eight first-class passenger coaches, eight second-class passenger coaches and eight baggage cars. The Pullman Company will furnish the road with its sleepers, and is now building eight of the latest style cars for service on the road. These sleeping-cars are arranged so that they can be used between Chicago and other points on the narrow-gauge road. At Cairo the trucks will be changed. Beside the above two sleepers are being built for the Central Vermont and two for the Missouri Pacific.

The shops of the Wilmington & Weldon road at Wilmington, N. C., are building 50 box cars for the road.

The Virginia Midland shops in Alexandria, Va., are building two passenger cars for the road, which are provided with all the modern improvements.

The Jackson & Sharp Co., Wilmington, Del., have just completed two very handsome Eastlake passenger coaches for the Cincinnati, Wabash & Michigan road.

The Eastern Railroad shops in Salem, Mass., will soon begin to build 250 box cars for the road.

#### Bridge Notes.

The Pittsburgh Bridge Co. is building four heavy iron bridges for the Buffalo Branch of the Rochester & Pittsburgh road.

Clark, Reeves & Co., at Phoenixville, Pa., are building an iron bridge 400 ft. long at New Sarum, Ont., on the Great Western Railway.

The Corrugated Metal Co., of East Berlin, Conn., is running its works day and night with two sets of hands. Among other contracts now on hand are three double-track plate girder bridges and three spans of 120 ft. each, and one 160-ft. double-track draw-bridge for the New York, New Haven & Hartford road; one double and one single-track bridge for the Eastern Railroad, and a single-track plate girder bridge for the Concord Railroad. The shops have just completed a 205 ft. span highway bridge at Waterbury, Conn., the largest span highway or railroad bridge in the New England States.

#### Iron and Manufacturing Notes.

The new firm of George A. Morrison & Co., dealers in railroad supplies, has been established at No. 12 Cortlandt street, New York. Mr. Morrison was recently in the office of the New York, Lake Erie & Western road, and formerly with the New Jersey Central. The firm has taken the general agency of the Tallman automatic brake.

The Valley Machine Co. at Easthampton, Mass., is putting in two of its improved bucket-plunger steam pumps for the New York, Providence & Boston road, to replace two old style pumps of the same make which have been in use 12 years.

The new blooming mill of the Pittsburgh Steel Casting Co. is nearly finished; it is 102 by 200 ft., of iron.

Sligo Furnace, in Dent County, Mo., made in July 1,577 tons of Bessemer pig iron, using 60 bushels of charcoal to make a ton of iron.

The Ashland Iron Works, at Ashland, Ky., are using a good deal of Alabama ore, which is carried by the Cincinnati Southern to Cincinnati and thence in barges up the Ohio.

The buildings of the Youngstown Steel Co., at Youngstown, O., will be ready for use shortly.

#### The Rail Market.

**Steel Rails.**—The Iron Age says: "A very heavy business has been entered recently, and negotiations are pending for large lots additional. It is safe to assume that 125,000 to 150,000 tons have been taken, and that from 50,000 to 100,000 tons more will be definitely closed before the end of the month. The business has been distributed very evenly East and West, and it is believed that all the leading concerns have now secured a fair amount of winter work. Prices are said to be quite steady, and for small lots full rates have been realized without much difficulty. So far as we can learn, \$45 has been the lowest figure for large lots, and from that up to \$47, according to location of mill, covers the transactions above mentioned. Small lots for early delivery command \$46 to \$48 for ordinary sections; light rails, \$48 to \$50."

**Iron Rails.**—Are quiet and unchanged, with no new business reported.

**Rail Fastenings.**—Spikes are in active demand, and steady at \$2.90 to \$3 per 100 lbs. Fish-plates are somewhat scarce and quoted at \$2.65 to \$2.75 per 100 lbs.; track-bolts unchanged at \$3.75 to \$4.25, according to specification.

**Old Rails.**—Sales of small lots of tees (iron), are reported at \$27 to \$27.50 per ton in Philadelphia. There is some demand for crop ends, which are held at \$24 to \$24.50 per ton.

**Steel Blooms.**—There has been lately some inquiry for steel blooms, and holders ask about \$37.50 per ton, duty paid. This seems to be considered too high, and no sales are reported.

#### How Mexican Railroads Cultivate Public Favor.

The Cincinnati newspaper *El Continental* of Aug. 22 says: "We understand that Mr. Schuyler, the Superintendent of the Sinaloa & Durango Railroad Company, desirous of decorating the stations of the line, will very shortly establish an elegant garden at Limoncito, to serve as a recreation ground for all the belles who may promenade during the present summer season."

#### Draw-Bars and Chains.

A correspondent, writing to the *Times* on the losses of life and property resulting from recent cases of broken draw

bars, says: "The cause is not far to seek; it certainly is that the wagon companies do not now put side chains to the wagons, as they formerly used to do. A draw-bar breaks, and, of course, pulls out; the end sticks in the ground, lifts the next carriage up and off the rails, and a number follow; and should a train be passing in the opposite direction, the consequence is a fearful loss of perhaps both life and property. Let any person watch the starting of a train of, say, thirty wagons, of about ten tons each, which will happen, possibly, twenty times between London & Birmingham, and see the fearful strain put upon each draw-bar as the train is put in motion—jerk, jerk, jerk—and the wonder is that broken draw-bars are not many times more numerous than they are. When side chains are fitted to each wagon, and they are properly linked, if a draw-bar breaks the side chains catch the strain and prevent the draw-bar from falling out, and by its falling upsetting the train or any part of it. The four chains to each truck would not weigh more than about 56 lbs. Side chains would have prevented the two recent accidents, and the far more terrible one at Holloway a short time ago." It will be seen that this correspondent is not aware that side chains have rarely been known to be of any service when a draw-bar breaks, as, when that takes place, the side chains break too. Stronger side chains with a volute spring at their backs might, however, be of value.—*London Engineer*.

#### A Train Robbery that Didn't Occur.

A dispatch from Dallas, Tex., Sept. 21, says: "Postal officers and railroad men were notified several days ago of the discovery of a plot for about a dozen train robbers to plunder the mail, express and passengers on the west-bound Texas & Pacific train due here at 8 o'clock last night. The robbers, it was claimed, had been in Dallas some time, and had arranged their plans for the robbery to occur three miles east of the city, at White Rock Creek, just at dusk. A big force of guards and detectives were placed on the train at Terrell, 32 miles east. A large number of railroad officials congregated at Dallas. Two Arkansas sheriffs and a Missouri constable came all the way out here by notification to assist and see who the robbers to be captured were, as it was considered certain that Frank James and the remnant of his gang were to do the robbing; but no robbery occurred, and the great scare reached the newspaper correspondents and reporters to-day by passengers who had been given arms on the train. The railroad people and postal authorities claim that the robbery was to take place just as detailed, but say that it was prevented by the heavy rain which fell during the afternoon and evening, the robbers postponing the attack because, if made, they could be followed up by the prints of their horses' feet in the soft ground, and be captured. The railroad postal authorities are still apprehensive of a robbery."

#### Mexicans Inspecting a Railroad Train.

A correspondent of the Chicago *Tribune*, present at the celebration of the opening of the Mexican Central Railroad from El Paso to Chihuahua, writes as follows from Chihuahua, Sept. 16: "On opening our eyes this morning, we were greeted with a wonderful sight. Thousands of Mexicans—men, women and children—in rude carts, in wagons, on horseback, astride of patient, long-eared, sombre burros, on foot, or drawn by oxen, swarmed about the train, filled with an ungovernable curiosity. They crawled in under the cars in the shade; ran their hands over the varnished panels of the passenger coaches; stood in an impenetrable crowd around the locomotives, wondering at their bright machinery and gay decorations—starting nervously at the screech of the whistle or the escape of steam from the safety-valve, and handling admiringly such portions of the huge machines as they could reach. The crowd represented every class of society. There were Castilian ladies and gentlemen, dressed in the finest silk and broadcloths, cut after the Parisian style; Mexican men and women of the middle classes, with their bright costumes and brilliant sashes, the broad white hats of the men contrasting with the black shawls and bead-dresses of the women; the representatives of the poorer classes, walking upon sandals, and dressed more gorgeously, though less expensively, than the others, jostling each other, and crowding for the best places from which to view the great curiosity of which they had heard and dreamed so much. Some rancheros, dressed in black, with silver lace and buttons covering their costumes, their dark faces shaded by brigandish sombreros, sat upon their clean-limbed horses and gazed on the train from a distance.

"About 9 o'clock it was suggested that the people be allowed to walk through the train; and, with Mr. Anthony's consent, the interpreters invited the crowd to get on board and look through the cars. Such shouting, struggling, laughing and good-natured contests to be among the first on board, I had never before witnessed. Mothers with babes in their arms exhibited the spryness of cats in climbing upon the steps, and old men developed unlooked for activity and scrambled with the others. As they crowded through the cars, expressions of surprise and delight were heard on every hand—the Pullman sleeper coming in for the greatest share of curiosity and wonder. One of the sections was made up by the porter, and the attention of the Mexican señoras and señoritas was called to it. They felt of the woodwork and sat down upon the cushioned seats with little cries of delight. In fact, their actions were like those of a lot of children over a new toy. For an hour and a half they filled the train from one end to the other; and then, though there were thousands who had not yet been on board, the people were told that they must get off the train."

#### A Freight Incline Road.

Natchez is situated at the top of a high, level bluff, on the eastern bank of the Mississippi River, the only connection between it and the river having been, until recently, by means of a steep road, over which all the freight to and from the city had to be hauled by drays. An incline plane, operated by steam, is now employed to raise and lower freight directly from the wharf-boat at the river to the bluff above. The location of the plane is such that its lower end terminates in the river, the cars descending against the wharf-boat. As the river rises and falls about 40 feet (maximum), the length of the plane is increased or decreased about 200 ft., according to the state of the tide of the river. The platform cars are framed of wood, and have tracks laid upon them of 3½-ft. gauge for the narrow-gauge freight cars they are designed to carry.

#### Chemical Composition and Wear of Steel Rails.

Some time since, Professor Gruner, through the *Annales des Mines*, brought the results of the investigations of Dr. Dudley on the relation between the chemical composition and the mechanical properties of steel rails to the notice of French engineers, indorsing the general conclusions. Recently, M. P. Escalé, a well-known engineer, has come forward in a paper read before the Société de l'Industrie Minière, in which he urges, as the result of his experience, that the specifications of French railroads demand a steel which is too hard. On May 30, he inspected the first rails of open-hearth steel at the Tamaris Works for a French railroad. They had been laid in the early part of 1880, and had borne a traffic of 2,700,000 tons. Contrary to usual experience,

these rails showed no trace of defects developed under that duty, and the wear was inappreciable. The average of the analyses made at the works of the steel made at the time the rails were manufactured was as follows. M. Escalé contrasts these figures with those of the best two rails and the 32 worst rails of Dr. Dudley's series, and calls attention to the fact that his own are harder than either. The following are the figures in question:

	Best two Pa. RR.	Worst 32 Pa. RR.	Tamaris.
Carbon	0.334	0.380	0.409
Manganese	0.491	0.647	0.652
Phosphorus	0.077	0.106	0.150
Sulphur	not det'd.	not det'd.	0.020
Silicon	0.000	0.047	not det'd.

The Tamaris rails would be classified as soft rails in France, while really, compared with those examined by Dr. Dudley, they are hard. According to the general observations on the road on which the Tamaris rails were laid, the mean wear of the rails is 0.0003 millimetres per annum for the first few years, and diminishing gradually, declines to 0.00015 millimetres per annum, after 10 years' service. M. Escalé calculates that at this rate they will be worn out in 80 years, while, from the data of loss of weight given in the case of Dr. Dudley's rails, he computes a life for the softer rails of from 100 to 150 years. Mr. Escalé urges, therefore, that the specifications of the French roads, calling as they do for 0.5 carbon, should be modified so that softer steel be used.—*Engineering and Mining Journal*, Sept. 23.

#### OLD AND NEW ROADS.

**Bangor & Piscataquis.**—Mr. John F. Anderson was recently employed by this company to make a survey of the two lines proposed for the extension of this road towards Moosehead Lake. He reports that the old line through the Piscataquis Valley, surveyed several years ago by A. F. Hilton, is much to be preferred to the route by Monson, which had been urged, the latter being longer, more expensive and involving the use of heavier grades, and the crossing of an additional summit.

**Binghamton & Williamsport.**—This company has been organized to build a railroad from Binghamton, N. Y., southwest to Williamsport, Pa., about 95 miles, through a country abounding in lumber and some coal. It is a revival of an old project.

**Boston & New York Air Line.**—In the United States Circuit Court at Syracuse, N. Y., Sept. 26, argument was heard in the suit of Wm. J. Hutchinson to enjoin this company from completing the lease of its road to the New York, New Haven & Hartford Company. In this suit a preliminary injunction was recently granted, and the case came up on the rule to show cause why it should not be made permanent. It was shown that there was no fraud or suggestion thereof in the lease, and that the common stock could not be injured. After hearing the arguments, the Court dissolved the injunction.

**Burlington, Cedar Rapids & Northern.**—Track-laying is progressing on the Pacific Division. The track is now 15 miles northwest of Spirit Lake, Ia., and connection will be made at Worthington, Minn., in about two weeks. A heavy ingress of immigrants has followed the progress of the road.

The company is erecting a large hotel at Spirit Lake, to be ready for the pleasure business of next year. Indications are that this region of lakes will prove a very attractive summer resort. The company have discouraged travel there all this season because accommodations were limited, yet there have been times when the banks of the lakes swarmed with visitors.

**Camden & Atlantic.**—Recently the board of directors of this company declared dividends of 4 per cent. on the preferred and 3 per cent. on the common stock, payable Oct. 16. Mr. Wm. L. Elkins, a stockholder, thereupon made application to the Chancellor of New Jersey to enjoin the payment of the dividend on the common stock. The Chancellor granted the usual preliminary injunction, with an order to show cause on Oct. 10 why it should not be made permanent. No objection is made to the dividend on the preferred stock.

**Central Iowa.**—It is reported that negotiations are in progress for a lease of this road to the Chicago & Northwestern, but nothing very definite is known.

**Chester & Lenoir.**—At a meeting held Sept. 23d the stockholders voted to approve a lease of the road to the Charlotte, Columbia & Augusta Company. The lessee agrees to assume the present debt (about \$280,000), to pay 1½ per cent. yearly on the stock, and to complete the road to Lenoir within eighteen months. The lessee will also have the right to issue new bonds on the extension to Lenoir to an amount proportioned to those outstanding on the completed line. The road is now in operation from Chester, S. C., to Mayden, N. C., 72 miles, and the extension to Lenoir, 88 miles further, is partly graded. It is of 3 ft. gauge. The road has already developed a very fair local business.

**Chicago & Eastern Illinois.**—It is again reported that the Louisville & Nashville Company has secured a controlling interest in this company, and that the road, with the Evansville & Terre Haute, will shortly be added to the Louisville & Nashville system, giving that company a line from Evansville to Chicago under its own control.

**Chicago & Northwestern.**—On this company's Maple River line the grading of the extension from Sac City, Ia., to Correctionville, 35 miles, has been completed, and track-laying has been begun.

On the Sioux Rapids Branch track is now laid to Orange, Ia., 25 miles westward from the late terminus at Peterson, and 107 miles from the main line of the Northern Iowa Division at Eagle Grove. Track-laying is in progress towards Calliope, which is to be the winter terminus.

It is reported that the company has secured the right of way into Aurora, Ill., and that it will extend a branch to that city. The right of way is said to have cost over \$60,000.

The following official notice was sent to the New York Stock Exchange on Sept. 20:

"The Chicago & Northwestern Company hereby gives notice that it has perfected consolidation with the Menominee River Railroad Company and the Escanaba & Lake Superior Railroad Company—two of its proprietary roads in Michigan—at the adjourned meeting of the stockholders held at Escanaba, Mich., on the 14th inst.; and that it will, after 30 days, issue at its convenience the amount of 16,200 shares of its common stock in payment and exchange for the capital stock of said Menominee River Railroad Company and of the Escanaba Railroad Company, in accordance with the terms of such consolidation."

**Cincinnati, New Orleans & Texas Pacific.**—This company will begin Oct. 1 to run a through train with through sleeping-cars between New Orleans and Vicksburg, running over the Cincinnati Southern, the Alabama & Southern and the Vicksburg & Meridian roads.



**Columbus, Chicago & Indiana Central.**—Notice is given that before Oct. 1, 1882, when the time limited by the reorganization agreement of this company will expire, persons must sign the same if they desire to participate in its advantages. Subscriptions will meantime be received at the office of J. S. Kennedy & Co., 63 William Street, or C. J. Osborn & Co., 34 Broad Street, New York.

**European & North American.**—This road will be formally turned over to the Maine Central company on Oct. 1, under the lease lately ratified.

**Genesee Valley.**—The track on the gap between Portageville and Nunda, eight miles, is now laid, and has been inspected and accepted from the contractor. The road is now very nearly finished all the way from Rochester to Hinsdale, 100 miles.

**Hannibal & St. Joseph.**—Notice is given that 25 land grant bonds have been drawn for redemption in accordance with the terms of the mortgage, and that they will be paid on presentation to the Farmer's Loan & Trust Company in New York. The numbers drawn are: 50, 58, 109, 117, 129, 178, 191, 203, 433, 444, 468, 491, 505, 533, 594, 646, 652, 669, 679, 718, 719, 759, 764, 800 and 858. Interest on these bonds will cease from Nov. 24 next.

**Housatonic.**—It is thought probable that this company will extend its road from Pittsfield, Mass., to North Adams, by Pontotuc, Lauesboro, Cheshire and Adams. The distance is about 21 miles, and the line is said to be a very good one.

**Illinois Central.**—Work is progressing well on the branch from Buckingham, Ill., on the Middle Division, northwest to the Wilmington coal field. It will be 12 miles long, and will probably be opened next week.

Work is in progress on the extension of the Middle Division from Colfax, Ill., west by south to Bloomington, about 20 miles. Work is being pushed from both ends of the line.

When the improvements now in progress are completed, the company will have six main tracks from Chicago to Grand Crossing, 10 miles; four tracks thence to Matteson, 18 miles, and two tracks from Matteson to Kankakee, 28 miles.

**Indiana, Bloomington & Western.**—This company now operates directly the Peoria Division from Peoria, Ill., to Indianapolis, 212 miles; the St. Louis Division, from Decatur, Ill., to Indianapolis, 153 miles; the Middle Division, from Indianapolis to Columbus, O., 184 miles; the Ohio Division, from Springfield, O., to Sandusky, 130 miles, with the Findlay Branch, 16 miles. This is a total of 695 miles. It also controls, but works through a separate organization, the Ohio Southern road from Springfield to Wellston, 118 miles.

Three through express trains are now run on the line of 396 miles between Columbus and Peoria.

**Jacksonville Southeastern.**—This road will be extended from Litchfield, Ill., to Smithton (on the Vandalia line), 29 miles, this fall.

The grading and bridging are nearly completed, and as soon as the contractors are ready steel rails will be laid. The road will then be 83 miles in length from Jacksonville to Smithton.

**Lake Shore & Michigan Southern.**—It is understood that the money for the payment of the \$2,527,000 bonds falling due next month is derived from the sale of second consolidated bonds. These bonds are now quoted at 125 to 126, so that a considerable reduction in the amount of debt could be effected.

At a meeting of the board held Sept. 27, the usual quarterly dividend (2 per cent.) was declared. No statement of the operations of the road was presented.

**Litchfield, Carrollton & Western.**—A contract has been let to J. J. Tracy, of Hannibal, Mo., to grade the section of this road from Carrollton, Ill., to Greenfield, 12 miles. The work is to be done by December.

**Little Rock & Fort Smith.**—It is reported in Boston that Jay Gould has lately been in negotiation to secure this road as a feeder to the Iron Mountain.

**Louisville, Evansville & St. Louis.**—This company has completed arrangements for the opening of the through line between Louisville and St. Louis, over its own line from Louisville to Mt. Vernon, Ill., and the Louisville & Nashville tracks from Mt. Vernon to St. Louis. Trains will begin to run through about Oct. 2. The distance between Louisville and St. Louis by this line is 260 miles, against 323 by the Ohio & Mississippi.

**Maine Central.**—This company takes formal possession of the European and North American road, Oct. 1, under the lease lately made.

**Marquette, Houghton & Ontonagon.**—The net earnings for July were \$91,326, making the net earnings from July 1, \$337,909, against \$174,693 in 1881, a gain of \$163,216, or 94 per cent.

**Merietta & Cincinnati.**—The further hearing in the foreclosure suit has been postponed to Oct. 16, at Chillicothe, O. The postponement is to give the Special Master more time to take testimony in relation to the securities deposited with the Reorganization Committee.

**Massachusetts Central.**—Mr. N. C. Munson, late contractor for the construction of this road, has, it is said, made an offer for the controlling interest in the company. His object is to secure possession and resume work, and he is reported to have New York assistance promised to him.

**Memphis & Charleston.**—Notice is given to stockholders that, in accordance with the resolutions adopted at the recent annual meeting, they will have the privilege of subscribing for an amount of new common stock equal to their present holdings, at 12 per cent. of its face value. This privilege will continue until Oct. 10. Applications must be made to the committee having the matter in charge at the office of the Real Estate Trust Company in New York.

It is reported that the committee has reached an agreement with the East Tennessee, Virginia & Georgia Company in relation to canceling the lease of the road to that company. No official statement has been made.

**Nashville, Chattanooga & St. Louis.**—This company makes the following statement for August and the two months of its fiscal year from July 1 to Aug. 31:

	August.	Two months.
Earnings	\$18,304	\$32,204
Expenses	100,011	193,717
Net earnings	\$63,293	\$133,577
Interest and taxes		92,684
Surplus		\$42,893

For the two months there was an increase of \$10,547, or 3.3 per cent., in earnings; a decrease of \$6,844, or 3.4 per cent., in expenses; and an increase of \$7,391, or 14.7 per cent., in net earnings. The surplus over interest and taxes shows an increase of \$10,933, or 34.3 per cent.

**Nevada & Oregon.**—Track on this road has reached Roberts and Antelope stations in Long Valley, Cal., about 22 miles northward from the starting point at Reno, Nev. Regular trains began running Sept. 18 between Reno and Long Valley. The company expects to reach Honey Lake, 50 miles further, this year, and to complete the road to the Oregon line at Goose Lake in 1883. The road runs east of the Sierra Nevada, where there is some settled and fertile country.

**Newfoundland.**—Work is in progress on this road, and already 80 miles of track have been laid from Harbor Grace to Holyrood at the head of Conception Bay in the Island of Newfoundland. Work is in progress from the end of the line and also from Carbonear.

**New Orleans & Northeastern.**—The track on this road is now laid from Meridian, Miss., south by west to Enterprise, 27 miles, and a local train will soon be put on this section. Work is in progress all along the line from Enterprise to Lake Pontchartrain, and much of it is nearly ready for the rails. It is expected that the track will be laid before the great pile bridge over Lake Pontchartrain is finished, although work is advancing steadily on that structure.

**New York, Central & Hudson River.**—On the morning of Sept. 22 a New York, New Haven & Hartford local passenger train running over this road, which had, with other trains, been forced to take the track through the side tunnel on Fourth Avenue in New York, on account of the derailment of a passenger train in the main tunnel, was stopped at Eighty-sixth street by a signal and by torpedoes on the track. A few minutes afterwards a Harlem rapid transit train came up at considerable speed and ran into the rear of the New Haven train, the Harlem locomotive running completely through the rear car and making it a complete wreck. Two passengers were killed, three fatally hurt, two bruised and six passengers less severely injured. The train had been much delayed owing to the confusion resulting from the block of the main track, and a number of persons had left the car at the station above and gone to the Elevated road, or the loss of life would probably have been greater. An investigation is now in progress, but the accident seems to have been due to the defective system of signals, or to the neglect of an operator at the station above.

**New York, Chicago & St. Louis.**—No date has yet been set for the opening of this road. The trains will not run into the Illinois Central station in Chicago, the Michigan Central as joint owner of the station objecting. Application has been made to the City Council of Chicago for the lease of a lot of land on the Lake front, on which a temporary station will be built.

**New York, Lackawanna & Western.**—This road is not yet quite ready for through passenger trains, but coal trains are now run through to Buffalo, and an accommodation train was this week put on between Buffalo and Elmira.

**New York, Ontario & Western.**—The very severe rain storm of last week did much damage at the Webster tunnel. The deep cut at the western approach to the tunnel was badly washed and some damage was done in the tunnel itself and at the shaft on the hill. Some delay will be caused in the work, besides the direct money loss. At the eastern or river end of the tunnel the damage was slight.

**Norfolk & Western.**—This company makes the following statement for August and the eight months ending Aug. 31:

	August.	Eight months.
Gross earnings	\$222,161	\$1,438,655
Expenses	109,540	833,832
Net earnings	\$112,621	\$604,823

Expenses include estimated proportion of yearly taxes. For the eight months there was an increase of \$74,028, or 5.4 per cent., in gross earnings; an increase of \$85,436, or 11.4 per cent., in expenses, and a decrease of \$11,408, or 1.8 per cent., in net earnings.

**Northern Pacific.**—For the \$5,000,000 consolidated general mortgage bonds offered by the syndicate for public subscription on Sept. 21, applications at 102½ per cent. were filed for about \$7,500,000. The subscriptions were all made in this country, the bonds not having been offered in the foreign markets. The price obtained is ½ of 1 per cent. above that for which the \$20,000,000 previously sold were marketed. It is not likely that any more of these bonds will be offered this year.

**Ohio Central.**—Work has been progressing rapidly on the line from Pt. Pleasant, where the bridge over the Ohio is to be built, southeast to Charleston, W. Va., 57 miles. A large part of the grading is done, and tracklaying is in progress.

**Oregon Railway & Navigation Co.**—The Baker City Branch is now completed from Umatilla to Pendleton, O., 114 miles, and trains have begun to run to the new terminus. Work is progressing on the contract for grading 57 miles, from Pendleton to La Grande, in the Grande Ronde Valley.

**Pennsylvania.**—This company's statement shows for the month of August, as compared with the same month in 1881, on all lines east of Pittsburgh and Erie:

An increase in gross earnings of	\$861,201
An increase in expenses of	272,845
Net increase	\$588,356

For the eight months ending Aug. 31, as compared with the corresponding period in 1881, the same lines show:

An increase in gross earnings of	\$2,326,943
An increase in expenses of	2,369,496
Net decrease	\$62,553

All lines west of Pittsburgh for the eight months of 1882 show a surplus over all liabilities of \$506,252, being a decrease, as compared with the corresponding period in 1881, of \$1,548,518.

The net decrease for all the lines, for the eight months of the current year, has therefore amounted to \$1,611,071 from last year.

The report that this company would build a line of its own to Reading has received some confirmation from the filing of two certificates of incorporation at Harrisburg, which cover a line from near Radnor Station, 12 miles from Philadelphia, by Phoenixville and Pottstown, to Reading. Part of the line has already been surveyed, the engineer having reached Birdsboro, seven miles from Reading.

**Phoenixville, Pottstown & Reading.**—This company has been organized to build a railroad from Phoenixville, Pa., to Reading, about 33 miles. It is controlled by the Pennsylvania Railroad Company.

**Philadelphia, Norristown & Phoenixville.**—This company has filed articles of incorporation for a railroad from the Pennsylvania Railroad near Radnor station to Phoenixville, Pa., about 20 miles. The organization is controlled by the Pennsylvania Railroad Company.

**Philadelphia & Reading.**—The Receiver's statement for August and the nine months of the fiscal year from Dec. 1 to Aug. 31 is as follows:

	August.	Net.	Nine months.
Railroad Co.	Gross.		
Railroad traffic	\$1,784,903	\$854,554	\$6,324,401
Canal traffic	1,6468	84,180	1,7792
Steam colliers	49,465	1,170	195,63
Richmond barges	4,77	1,227	15,610
Total R. R. Co.	\$1,975,993	\$950,065	\$6,610,260
Coal & Iron Co.	1,615,218	221,214	661,955
Total	\$3,591,201	\$1,171,209	\$7,291,221

\* Loss.

The expenses do not include anything for interest or rentals, the net earnings being the amount from which these charges are to be paid.

A comparison of net earnings is as follows:

	1882.	1881.	1882.	1881.
Railroad Co.	\$950,065	\$1,003,763	\$6,324,401	\$6,324,401
Coal & Iron Co.	221,214	151,503	661,955	661,955
Total	\$1,171,209	\$1,155,266	\$6,986,356	\$6,986,356

For the month the Railroad Company shows a decrease of \$53,678, or 5.3 per cent., and both companies an increase of \$16,033, or 1.4 per cent. For the nine months the Railroad Company shows an increase of \$378,506, or 6.1 per cent.; the Coal & Iron Company a decrease of \$2,143, or 3.2 per cent., and both companies a total net gain of \$356,363, or 5.1 per cent.

**Pittsburgh, Chartiers & Youghiogheny.**—Work is progressing well on this road, and track has been laid from Chartiers, Pa., on the Pittsburgh & Lake Erie road, west five miles. The grading is nearly finished to the terminus on Painter's Run, 13 miles from Chartiers. It is to be a coal road.

**Pittsburgh Southern.**—It is reported that the parties who bought this road some months ago have sold it to the Baltimore & Ohio for about \$250,000. The new owner, it is said, will put the road in good condition and change it to standard gauge, thus completing its own line from Wheeling to Pittsburgh.

**Round Top.**—This company has been organized to build a railroad from Gettysburg, Pa., over the Gettysburg battle field, ending at the farm on Round Top Hill. It will be three miles long, and will be worked by the Hanover Junction, Hanover & Gettysburg Company.

**St. Louis, Iron Mountain & Southern.**—Work is progressing well on the branch from Neelyville, Mo., to Doniphan in Ripley County. Nearly half the grading is done and the contractor expects to finish in December.

**Storm.**—A wide-spread and very destructive rain-storm began in the Eastern and Middle states on Sept. 21, and continued until late on the evening of Sept. 23, the amount of rain falling during that time having been greater than during any storm recorded for over 30 years. The storm was confined principally to the sea coast, not extending very far inland, and its most destructive effects were felt in the Hudson Valley and in New Jersey. In that district the railroads suffered severely from wash-outs and the loss of bridges, and on many roads there were accidents of more or less severity from these causes. The Pennsylvania Railroad between New York and Philadelphia was entirely blocked by the floods at Trenton and other points, and for two days its through trains ran over the Bound Brook line between Elizabeth and North Plain Junction. Other roads were badly blocked, and the aggregate loss must have been large.

**Toledo, Cincinnati & St. Louis.**—Track is now laid from Ramsay, Ill., west by south to Fillmore, 15 miles, and the work is progressing well. The gap of 40 miles between Stewardson and Ramsay has not yet been filled, the track-layers having been obliged to wait for the completion of some bridges and a long trestle.

**Troy & Greenfield.**—The second track on this road has been completed from North Adams, Mass., to Zoar, 11 miles. This includes the section through the Hoosac Tunnel and some of the most difficult work on the improvement.

**Union Pacific.**—The Alpine tunnel on the Denver & South Park Division is claimed to be the highest railroad tunnel in North America or Europe. The tunnel is 1,800 ft. long, and its western portal is 11,524 ft. above sea level. The entrance to the tunnel at the eastern end is on a sharp curve, which extends some distance into the mountain.

**Utica, Ithaca & Elmira.**—This company recently made application for the discontinuance of the suit brought by the Attorney General of New York to have the company declared insolvent, a hearing on the application was had in Albany, Sept. 28d. At its conclusion the Attorney General reserved his decision.

**Wabash, St. Louis & Pacific.**—As indicating the growing importance of this company's Chicago line, it is reported that during the first three weeks of September it delivered in Chicago 926,312 bushels of grain, against 264,949 in the corresponding three weeks of last year. The receipts this year are positively large, and heretofore the road has not brought much grain to Chicago, but has carried chiefly to Toledo.

**Western North Carolina.**—On the Ducktown branch of this road the track is now laid to Wayneville, N. C., 29 miles southwest from Asheville. A large force is at work beyond Wayneville, and the grading is well advanced.

**West Jersey.**—The company has paid off the certificates of the indebtedness of the leased West Jersey & Atlantic Railroad, amounting to \$60,000. Of this amount about \$45,000 was the debt incurred by the May's Landing accident in 1880. The remainder was paid for improvements of the road.

**Winnipeg & Hudson Bay.**—This company has been fully organized and surveys have been begun for the road from Winnipeg, Man., northeast to Nelson on Hudson Bay. It is said that proposals for the building of the road have been received.

**Woodruff Sleeping Car Co.**—Arguments were heard at Indianapolis last week on this company's application for an injunction to restrain the removal of its cars from the line between Indianapolis, Chicago and Jeffersonville. The contract for this service, according to Jeffersonville, was made by the old Indianapolis, Peru & Chicago Company with the Woodruff. The latter purchased the line, and later the Pan-Handle management secured a running arrangement between Indianapolis and Keokuk, giving them control of a through line. On the ground that the Pennsylvania Company had a contract to run Pullman cars on all lines operated or leased by it, notice was given the Woodruff Company to withdraw its sleeping cars on Sept. 18. To prevent being thrown out of the Woodruff Company applied for an injunction, requiring the contract with the Indianapolis, Peru & Chicago Company.